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HISTORY AND MEDICAL TREATMENT

OF

C H O L E R A.

LONDON:
Printed by A. & R. Spottiswoode,
New-Street-Square.

HISTORY
AND
MEDICAL TREATMENT
OF
C H O L E R A ,
AS IT APPEARED
IN SUNDERLAND
IN 1831,

ILLUSTRATED BY NUMEROUS CASES AND DISSECTIONS.

By W. HASLEWOOD, M. D.,
AND
W. MORDEY, SURGEON,
IN CHARGE OF THE CHOLERA HOSPITAL IN THAT TOWN.

LONDON:
PRINTED FOR
LONGMAN, REES, ORME, BROWN, GREEN, & LONGMAN,
PATERNOSTER-ROW.
1832.

522.



TO
ROBERT DAUN, M.D.
&c. &c. &c.

IN TESTIMONY OF THEIR SENSE OF THE VALUE OF HIS
PUBLIC SERVICES,
DURING THE PREVALENCE OF A NEW AND
AFFLICTING VISITATION,

IN
THE TOWN OF SUNDERLAND;

AS WELL AS OF THEIR HIGH ESTEEM FOR
HIS PRIVATE CHARACTER,
AND FOR THE CONFIDENCE AND FRIENDSHIP WITH WHICH
HE HONOURED THEM,

THE FOLLOWING PAGES ARE INSCRIBED

BY
THE AUTHORS.

INTRODUCTION.

THE opportunities which have been afforded to the Authors of the following pages, by their appointment to the Cholera Hospital, and by their attendance on those affected with the disease in other situations, have induced them to publish a short account of the Malignant Cholera at Sunderland, the place of its first appearance in England.

To their general account of symptoms and treatment are annexed Cases of the Disease as noted at the bed-side of the patient, elucidating the progress of the symptoms, with the various modes of practice pursued, and their results faithfully recorded; and to some of these cases the *post mortem* appearances are added.

In the general account of the Symptoms, they have divided them according to the different stages of the disease, which may be usually discriminated.

They would earnestly entreat general attention to what they have termed the Premonitory Symptoms. If there is a mode by which the progress of the disease may be arrested, it is the application of remedies at the earliest period of the attack:—
“*Principiis obsta*” ought to be our motto.

The remarks on the predisposing and exciting causes of the disease are the result of careful and, they trust, impartial investigation. Upon the subject of contagion, observation has led to conclusions opposed to their preconceived opinions. The facts on which these conclusions are founded will be fully stated; while it may be hoped that accurate observations at other places where the disease may appear, will set at rest a question of which the uncertainty is productive of so much evil. Their own conclusions they offer with diffidence, and with a readiness to reconsider them, and to weigh whatever further evidence may be adduced on the subject.

Concerning the date of the first appearance of the epidemic, or the mode of its introduction, great obscurity exists; and the facts, as yet ascertained, do not warrant us in coming to a decided conclusion.

We have the evidence of practitioners not likely to be led away by imagination, that, so early as August last, they witnessed cases differing in no respect from those of the present epidemic; but their occurrence *intra angusti, angustos cancellos*, in a year when the ordinary cholera was peculiarly rife, throws some obscurity on the question. It has been alleged that cholera of equal malignity with the disease at Sunderland was prevailing in different parts of the country to a late period of the autumn: to this assertion we can give a positive contradiction; having had the advantage of conversing with several intelligent medical men,

who had come from those very districts to witness the disease prevailing in this town ; and who very generally entertained an idea that they would find a disease similar to that they had already encountered : but a single well-marked case was always sufficient to convince them that the malady was one which they had never seen before, and which was quite new to this country.

On the subject of treatment, the Cases will afford the best evidence of the relative success which attended the various plans which were pursued : and not the least instructive will be those in which the remedial measures disappointed our expectations ; whether grounded on the experience of others, or suggested by merely theoretical views.

It must be confessed that the means employed were sufficiently various in their nature ; and the narrative of their effects may be useful, by inducing caution in the employment of those which have been found inefficient or injurious, or which have not in this country produced the results experienced from them abroad.

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HISTORY
AND
MEDICAL TREATMENT
OF
CHOLERA.

SYMPTOMS.

THOUGH the supervention of the violent symptoms of Cholera appears to a superficial observer to succeed a state of ordinary health, yet careful enquiry will usually discover the previous existence of some functional disorder, not sufficiently important, perhaps, to have attracted the serious attention of the patient, but which, if early attended to, might have enabled us to have warded off the frightful disease whose approach it indicated.

It is a matter of most serious importance that the attention of medical men should be strongly drawn to a subject involving so vitally the character of the practitioner, and the lives and interests of the people. From circumstances, which it is to be hoped will not exert the same influence in other places in which the disease may unfortunately appear, it was extremely difficult to induce the per-

sons attacked to apply for relief till the disease had assumed an alarming character; and it rarely fell to the lot of the medical men in Sunderland to witness the disease in its early stage, except when the cases came under their notice in visiting some other member of the family in which it occurred.

PREMONITORY SYMPTOMS.

In general it has been found that slight oppression of the breathing, with a soft and somewhat accelerated pulse, a degree of mental depression and inaction, anxiety of countenance, giddiness, and some muscular debility, are the earliest indications of the disease: the abdomen almost invariably feels distended, and is affected with slight, transient pains: the urine is scanty and pale. These symptoms are usually followed by a moderate diarrhoea, the discharges being natural, consisting of the usual ingesta: the character of the discharges, however (if the diarrhoea continues long enough uninterrupted by other violent symptoms), gradually changes; and they have, in some instances, assumed precisely the choleric character before any vomiting, cramp, or collapse had unequivocally declared the nature of the disease. Two other symptoms remain to be mentioned, which are of very frequent occurrence, and which, in conjunction with those previously noticed, may be considered almost diagnostic. We allude to slight cramps affecting the fingers and toes, or prevailing still more generally, and coming on during the night; and to a numbness, and feeling of inability

to move the limbs, approaching to paralysis : it is not a real inability, as a strong effort is sufficient to dispel the illusion. But the sensation recurs ; and it is fortunate for the patient if it create sufficient alarm to induce him to seek, without delay, medical assistance.

After the duration of the premonitory symptoms for a period varying from a few hours to as many days, the disease manifests itself in a manner which, once witnessed, can never be forgotten.

FIRST STAGE, OR THAT OF COLLAPSE.

In a great proportion of the cases, the violent symptoms have commenced between midnight and an early hour of the morning.

The first alarming symptom is commonly a sudden feeling of faintness, with tingling in the ears, and loss of sight ; and not unfrequently the patient falls down insensible. This attack is immediately followed by a burning pain at the pit of the stomach, and commonly by violent purging, vomiting, and cramps : great pain in the fore part of the head, or in the back, is an occasional, though rare, symptom of this period. The countenance becomes altered with great rapidity, assuming an appearance resembling that of old age ; the eyes are sunk in their sockets, and surrounded with a dark areola ; the lips are pale and blue ; the nose appears sharp and shrunk ; and in half an hour the countenance can scarcely be recognised : the skin is generally cold and damp ; the hands and feet, especially the nails, are blue—sometimes as dark as

if they had been dipped in a solution of indigo ; and the skin on the fingers and toes is sodden and shrivelled : the tongue is moist, cold, and flabby ; respiration is oppressed and difficult ; and the breath feels cold to the finger introduced into the mouth. One of the most striking changes is that produced in the voice, which is reduced to a husky whisper. The pulse sinks rapidly, sometimes becoming instantaneously imperceptible at the wrist : when perceptible it is but as a thread, and its frequency is increased.

Such are the symptoms which have ordinarily been witnessed in severe cases of the disease as it occurred in Sunderland ; but the individual cases have presented considerable variations in the general severity of the disease, in that of particular symptoms, and in the order of their succession. In some of the worst cases the vomiting and purging were extremely trifling ; a state of complete collapse was formed almost in a moment, and preceded only by a single attack of cramp, with the discharge from the mouth of a few ounces of clear fluid : in some instances, especially of children, the cramps were not observed to occur at all. The patient lying deadly cold, yet sensible in an extraordinary degree to the stimulus of heat, so as to express great annoyance at the use of external warmth, he complains of a burning pain at the stomach, with great thirst, calling urgently for cold water. The intellect continues unaffected, though sensation is depraved or blunted ; for the arm does not shrink when the lancet is introduced. The skin loses its natural tension and elasticity, and the orifice made by the lancet is sometimes quite

bloodless. This state usually terminates in coma, or furious delirium, to which death quickly puts an end.

In the *milder cases* the evacuations were profuse, the cramps unremitting, the coldness and collapse less rapid in their approach: but, invariably, some time before death these symptoms have disappeared, and it seemed that the stomach had lost its sensibility; the most powerful remedies, emetics or stimulants, appearing to produce no effect whatever.

SECOND STAGE, OR THAT OF REACTION.

When the cold blue stage does not prove fatal within twelve hours, it is, we believe, invariably followed by some degree of reaction, indicated by warmth about the præcordia, and by increased force of circulation in the larger vessels; though this does not extend far, nor, in the worst cases, restore the pulsation at the wrist. The pulsation in the femoral artery, for instance, indicates that the heart is acting with force; but it seems as if the blood had undergone some change, which renders it less capable of overcoming the friction or resistance of the smaller vessels. At this period, then, we date the termination of the first stage of Cholera: febrile excitement supervenes, of severity and character depending, in a great measure, on that of the former stage; but in the worst cases rapidly fatal, with coma or delirium.

DETAILED ACCOUNT OF THE SYMPTOMS OF THE
FIRST STAGE OF CHOLERA.

Vomiting.—We are not aware of any case of Cholera in Sunderland in which vomiting did not occur in some period of the disease, but the quantity discharged has been occasionally very trifling; and the vomiting is rarely attended with much effort, the fluid being expelled apparently by the action of the stomach alone, unassisted by the abdominal muscles. The appearance of the choleric discharges is very similar to that of barley water, or of a solution of soap in hard water, consisting of a clear fluid, with more or less of a white flocculent matter floating in it: there is also, very generally, a small quantity of a brown granular-looking substance which adheres to the bottom of the vessel. When the flocculent matter is abundant it collects into a stringy adhesive substance, which floats on the surface of the clear liquid, and it is then occasionally of a brown colour—derived probably from a mixture of the brown substance before alluded to. It has a considerable resemblance to albumen coagulated from the serum of the blood. The fluid is generally described as being tasteless; in some instances as being sour. When reaction is established—and not till then—a bitter taste is perceived if the vomiting continue. The discharges possess a very peculiar smell not easily described, but easily recognised when once experienced: perhaps the term *fusty* best describes it.

Purging.—This symptom, so prominent in the

ordinary cholera of this country, was altogether absent in two well marked cases of the present epidemic. In general, however, the purging is profuse; the discharges pass off with great violence, as if expelled by force through a contracted orifice. After the discharges have assumed the characteristic appearances, they are very rarely attended with flatus: the noiseless manner in which they escape is remarkable. The character of the alvine discharges is very similar to that of the matters vomited; the fluid, however, is more homogeneous, of a milky or buff colour, and sometimes of the consistence of jelly: in others it bears a striking resemblance to pus. This was so remarkable in one of the earliest cases, that it was imagined that some large abscess had broken into the intestines. The same peculiar fusty smell was always present in these discharges.

Cramps. — The flexors of the fingers and toes are generally the first muscles attacked with spasm; the gastrocnemii and muscles of the thigh are next attacked; and, more rarely, the muscles of the abdomen, the back, and the throat are affected. The affection has been observed very frequently to confine itself to one side of the body. It is commonly preceded by a creeping sensation, or *aura* passing *downwards*, in the course of the nerves; a single *fasciculus* of fibres begins to grow hard; and in a few seconds the whole muscle is contracted into a hard knot. When the abdominal muscles are affected, the body is bent forward in agony; but, perhaps, the most distressing case is that in which the muscles of deglutition are affected: the thirst is incessant, and every attempt to swallow

brings on an attack. The duration of each attack is generally about five minutes, though the spasm has continued unrelaxed even for a quarter of an hour; and, in an instance where the back was affected, the disease put on precisely the appearance of tetanus.

Appearances of the Blood.

None of the phenomena of the disease are more undeviating in their occurrence than those which are presented by the blood. From the commencement of the attack it gradually assumes a darker colour, and thicker consistence than natural. In the severest form of collapse, when a vein is opened, sometimes not even a tinge of blood appears; but more usually a few drops escape, being merely what had remained stagnant in the vessel. When the blood *does* flow, it escapes slowly, and trickles down the arm like a stream of treacle. Sometimes it collects at the orifice, coagulating as it flows, and requiring to be washed off with warm water. By pressure and friction, perhaps, it begins to flow more freely; and if this continues, the colour gradually improves. When this is the case a singular appearance is occasionally observed.—The stream consists of two distinct and separate portions, running side by side: the one still dark and tenacious; the other bright, of thinner consistence, and running with greater velocity. In the first instance where this was observed, we for a moment imagined that the appearance arose from some peculiarity of light; but close examination convinced us of the reality of the phenomenon;

and, attention being now called to the fact, it was subsequently remarked by several other practitioners.

The blood obtained from a patient in cholera coagulates quickly into a loose gelatinous-looking substance ; its colour, when viewed in a mass, is black ; but a thin layer on a white surface is crimson. Serum does not separate at the time of coagulation ; but in about twelve hours a small proportion is observed to have exuded on the surface and around the coagulum. Portions of fibrine of a leaden hue are sometimes observed separated from the dark substance, not expanded on the surface, but in patches intermingled with the rest of the mass.

Temperature of the Body.

The marble-like coldness experienced on applying the hand to the surface of the body in a case of Cholera is absolutely startling, and, like the feeling from a table of the same substance, impresses us with an idea that it is really of a lower temperature than surrounding objects. That the temperature of the body in this disease may, in some instances, be reduced as low as that of the circumambient atmosphere, and even lower, by the evaporation of the profuse moisture on the surface, is possible ; but we have reason to think that this did not occur in any case which came under our observation. In some cases where the coldness appeared most remarkable, the temperature was ascertained with great care ; a delicate thermometer being intro-

duced into the mouth, axilla, &c. The particular observations will be given with the cases in which they were made: and in this place it may be sufficient to observe that the temperature of the mouth was usually about 84° , and never below 80° ; that of the surface, 70° . Respiration is invariably imperfectly performed; the slow, interrupted mode of speaking, and anxiety, show how small a quantity of air is received at each inspiration. The respiration is usually rapid, being about thirty in a minute; but when collapse is profound, the breathing becomes so extremely slow and gentle that it is with difficulty perceived. At such a time, and without perceptible pulse, it is with difficulty we can distinguish between life and death: yet life has continued in these circumstances for some hours after the attendants were preparing to remove the body as dead. Even after death, however, the muscles have, in some rare cases, continued to be affected with violent contractions. This was observed in at least one instance in this town, and the same thing is mentioned by writers on the disease, as observed in India and on the continent of Europe. It has been ascertained by an analysis performed by Dr. Davy, in Ceylon, that the air expired in this disease contains not more than one third of the carbonic acid usually contained in the breath. The degree of blueness or lividity of the surface is a very exact criterion of the deterioration of the blood: it is considerably modified, however, by the natural complexion of the patient. The discolouration occasionally disappears after death; but in other cases the hands and feet continue of a dark blue. The appearance of the face is some-

times not unlike that produced by blows; and in one instance this gave rise to a difference of opinion. A female who was attacked with the disease, and died in about twenty hours, had been engaged in a brawl the day before her attack, and had received a slight wound with a fork. This death occurred at an early period of the epidemic, when many influential persons, including some medical men, were loudly asserting that no unusual disease existed in the town. It was, therefore, very generally asserted that the patient had died of the wound, and of blows on the head and face; the marks of which, it was said, were so very obvious. The body was examined in the presence of medical men of both opinions, and the question finally set at rest by a coroner's jury.

Function of Secretion.

While the skin is bedewed with clammy sweat, and while the other mucous membranes are pouring out a secretion vitiated in quality and augmented in quantity, there seems to be a total suspension of all glandular secretion. During the severest suffering, the eye even of childhood is tearless, the urine is suppressed, and the dejections are devoid of bile. From a consideration of the preliminary symptoms, it will appear that one of the earliest of the train of phenomena is a diminution of the healthy secretions; of the urine, which is pale and in small quantities, and sometimes of the bile, in so much that if that stage is protracted, the dejections assume their pale or pus-like appearance before the

accession of vomiting, giddiness, sinking, or even cramps. That digestion has been suspended for an equal period before vomiting commenced we have had convincing proof, from seeing food which had been swallowed two days before rejected quite unchanged.

Of the Stage of Reaction.

The fatal termination of the cold blue stage of Cholera occurs often without a struggle, or preceded only by a few short convulsive heavings of the chest; but in other instances a slight appearance of reaction, indicated by some throbbing of the carotids and warmth of the chest, is succeeded by sleep, from which the patient can only be roused for a moment: perfect coma succeeds; and the patient survives, perhaps, for a few hours. From the large doses of opium administered in some of the cases, we were at first disposed to attribute this state to narcotism; but we were subsequently convinced that it was by no means confined to such cases, and was rather to be attributed to the general tendency of the febrile stage of Cholera to produce cerebral congestion.

The comatose state is sometimes preceded by a sudden attack of furious delirium; the patient throwing off the bed-clothes, attempting to get up, striking every one within his reach, and raving wildly: the muscular strength exhibited is considerable; but the struggle is short, and soon succeeded by total insensibility.

When the spasms, the vomiting, and the purging

have ceased; when the pulse begins to return at the wrist, and the breathing becomes unembarrassed, and a genial warmth diffuses itself gradually and equably over the surface, the patient falls into a tranquil sleep, which continues some hours, accompanied with gentle perspiration: he awakes refreshed, declares himself "quite well," asks for something to eat, and is ready to be up and away. It is at this period the medical attendant is most likely to be thrown off his guard. Very limited experience, however, will convince him that there is yet a period of the disease calling for unremitting attention and decisive treatment. An almost invariable symptom at this period is a considerable suffusion of the eye; the cornea looks dull; vessels containing red blood are visible on the surface of the sclerotic, and are most numerous at the lower part of the eye.* The appearance differs from that of inflammation; the vessels are large and numerous, but terminate abruptly, rarely forming the vascular net-work observed in ophthalmia; the redness is dusky, and the affection unattended with pain. At the same time there is often some degree of stupor; and if the patient moves the head suddenly, he complains of a dull, deep-seated pain. The tongue is coated with white fur,

* The following case occurred in the practice of Dr. Ogden:—December 12. John Parkin, aged 4, attacked with Malignant Cholera in a severe form: during the cold stage the eyes had a dry and shrunk appearance, and the lower half of each cornea became opaque. The child recovered. In the febrile stage an onyx was formed in each cornea, where the opacity had been previously observed. For about three weeks the child was in a state of incoherence.

and rather dry ; or becomes red, glistening, and chapped. The secretions are not restored ; or, if restored, present unhealthy appearances : that of urine has continued suppressed for four or five days. When this has been the case, its restoration is attended with uneasiness in the bladder, and the attempt to void urine gives great pain, — arising, probably, from the accumulated sensibility of the mucous membrane, so long devoid of its natural stimulus. The discharges from the bowels become highly offensive, and contain an abundance of vitiated bile, and of the glutinous matter (sometimes in large masses) which gives the flocculent appearances to the earlier evacuations.

The patient is, in fact, labouring under a fever, bearing a considerable resemblance to the ordinary fever of this country, — assuming, in mild cases, a remittent or intermittent type, but always accompanied with a strong tendency to local congestions, especially of the brain : but where strong predisposition existed, or, in other words, when some organ was, from natural or accidental causes, peculiarly weakened, manifesting itself in it.

The first approaches of coma are often so insidious as to escape observation ; but the pulse continuing quick, with fetid watery discharges, and, above all, the continued suppression or insufficient secretion of urine, will convince the observer that all is not right ; drowsiness gradually increases, and his sleep is attended with stertor : he may still be roused, and will swallow what is offered him, but quickly falls back into the same state. If the eye is examined, the suffusion is found to have increased, the pupil is dilated, and almost or quite

insensible to light; and this phenomenon is sometimes confined to one eye. Complete coma succeeds.

When the patient dies with these symptoms, it is generally within from two to six days from the commencement of the attack.

The most decidedly favourable symptom in the second stage of Cholera is a full and early secretion of healthy urine. On this symptom we may rely with safety; and without it we can never with confidence offer a favourable prognosis.

The period of convalescence from the severer forms of Cholera has been usually protracted, and several weeks have elapsed before the patient has regained his usual health: but as the subjects of the disease have, in the great majority of cases, been persons with broken-down constitutions, the tardiness of recovery cannot fairly be attributed to any peculiarity in the malady distinguishing it from others of equal constitutional disturbance: digestion continues imperfect; the bowels are liable to be disordered from slight errors in diet; and, in some instances, chronic diarrhoea of great obstinacy has supervened. In fact, great caution is requisite to prevent a return of the original disease.

The most enduring memento of Cholera, however, is the irritable and debilitated state of the muscular system, which continues painful on slight exertion, and subject to constant recurrence of cramps. These attacks occur most frequently at an early hour of the morning, on awakening from sleep; perhaps the patient is aroused by them:

they are also apt to attack after long fasting, or on any slight disorder of the stomach and bowels.

We have now endeavoured to give a general description of the malady whose prevalence in Sunderland and the neighbouring towns has excited so deep an interest in the country. But it is necessary to observe, that many cases occurred during the same period of a much milder character, attended with the cramps, coldness, and diminished secretion of urine; and always succeeded by a febrile stage of some days' continuance. About many febrile attacks of this period much difference of opinion arose, from the very equivocal nature of their symptoms, and it was doubtful whether the unusual occurrence of cramps, and the frequency of diarrhoea, were to be considered as exhibiting one of the innumerable varieties of type which the continued fever of this country assumes under differences of situation and season, rendering the treatment successful in one epidemic inapplicable to another; or were to be viewed as examples of Cholera modified by the stronger stamina of the persons attacked, and the early application of remedial measures.

It is certain, however, that a peculiarity of diathesis was observable in the progress of almost every prevailing disease — in their being attended with cramp; the fact was noted both in public and in private practice, among the rich as well as the poor; and persons of delicate structure and a nervous temperament have complained of them, without being sensible of any other deviation from health. How far these symptoms may depend

upon mental impressions it is not easy to say ; but more than one medical friend has declared, that he never visited a well-marked case of cholera without suffering from cramp in the calves of his legs.

POST MORTEM APPEARANCES.

The *external appearances* of the body are striking and peculiar. The skin is generally livid ; on the hands and feet it is sometimes dark, and always corrugated into wrinkles. The eyes are sunk deeply in their sockets, and surrounded by a dark livid circle. The features are shrunk, and the nose is pointed. The fingers and toes are firmly fixed, in flexion or extension. The tendons on the top of the feet are tense, and stand off as if they had been dissected out. The muscles are extremely hard ; and so firmly are the limbs fixed, that when the patient has died in a bent position, it has been found impossible to straighten the body.

Internal Appearances.

It may be stated generally, that these indicate great venous hypercœmia, an opposite state of the arterial system, and a total want of arterialised blood ; the appearance of the blood exactly corresponding with that described in treating of the symptoms of the disease.

The brain, in cases fatal at an early period, displays nothing peculiar except the venous congestion before alluded to ; but when death occurs

after coma, or in the stage of re-action, the marks of increased vascularity are more considerable; evidenced in the dura mater, in opacity of the arachnoid, and by the existence of numerous bloody points in the medullary portion.

Chest. — Where death has occurred early, the serous membranes generally are remarkably devoid of moisture, the lungs are gorged with blood, the bronchiæ contain some frothy mucus, the right side of the heart is loaded with black tar-like blood, the venæ cavæ much dilated, and similar blood is found in the left side of the heart and aorta; it is very common to find polypous concretion in the left ventricle.

Abdomen. — Some venous congestion of the liver and spleen, but in a much less degree than in the lungs; the larger veins of the abdomen are much distended. The small intestines generally display more or less of a pink hue; the anterior surface of the stomach presents the same tint, sometimes even a deep red. Its mucous membrane appears some-

A SYNOPSIS OF THE POST MORTEM APPEARANCES OBSERVED IN

	NAME, AND DURATION OF ILLNESS.	AGE.	BRAIN AND SPINAL MARROW.	CHEST.		STOMACH AND INTESTINES.
				Heart, &c.	Lungs.	
1	Wm. Sprout; ill four days; died on the 31st October. Examined 16 hours after death.	35	Dura mater highly vascular and thickened, with deposition of fibrin on its surface. Pia mater and brain much congested, especially the pons varolii, and medulla oblongata. Serum 3ss. in the ventricles.	Right side loaded with black fluid blood; left ventricle and aorta empty.	Lungs gorged with red blood; bronchial linings red.	Stomach had one large patch of ecchymosis; small intestines highly vascular, and distended with flatus. Colon contracted. Mucous membrane generally deep red; at one part softened, with blood effused on its surface. A quantity of green bile in intestines.
2	Rodenby; ill 12 hours; died on the 31st October. Examined 20 hours after death.	35	Head not examined.	All its cavities, the aorta, and the venæ cavæ much distended with tar-like blood; large polypus in the left ventricle.	Serous membranes remarkably devoid of moisture. Lungs congested.	Superior surface of the stomach dull red. Mucous membrane softened and thickened with dotted redness, many corrugations, the ridges of which were tinged black. Colon sacculated from numerous contractions. No bile in the intestines, which were filled with a white fluid, and a white pasty substance.
3	Eliz. Short; ill three days; died 11th Nov. Examined 9 hours after death.	45	Not examined.	Heart natural; right side filled with tar-like blood, vena cava much distended.	Lungs highly congested, crepitating.	Stomach. Mucous membrane softened, and towards the cardia vascular; in the duodenum slight patches of ulceration on elevated bases. No bile had been secreted.

what softened, displaying a dotted redness, especially towards the pylorus ; and, in some instances, we thought we perceived slight abrasions. The same appearance, with some thickening, was observed in the duodenum, in a case which proved fatal on the fourth day.

The intestinal canal contained the characteristic discharges, which, in the colon, assumed a pasty consistence, and were lodged in cells formed by a number of alternate contractions and dilatations of its muscular coat. When death occurred in the febrile stage, the contents were very offensive.

The urinary bladder was empty, or contained about a drachm of pus-coloured fluid similar to that in the bowels ; it was firmly contracted, and lay close to the os pubis.

The following table gives a comparative view of the appearances observed in twelve cases, with the number of days or hours during which the patient survived the attack : —

TWELVE CASES OF CHOLERA IN SUNDERLAND AND ITS VICINITY.

OTHER ABDOMINAL VISCERA.	EXTERNAL APPEARANCES.	REMARKS.
<i>l</i> acera natural. Gall bladder full of bile. Urinary bladder firmly contracted; contained a few drops of a whitish fluid.	Muscles firmly contracted. Abdomen much retracted.	This case affords an example of the appearances when death has occurred in the febrile stage. The patient expressed himself quite well on the evening of the 28th.
Gall bladder distended; its duct imperious to a probe, and not permitting the bile be squeezed out. Spleen and vena portæ stained much black tar-like blood. Urinary bladder firmly contracted; contained a pale white fluid, similar to that in the intestines.	Skin felt soft and pasty. Muscles extremely rigid. Tendons very tense. Nails and fingers and toes blue. Eyes sunk.	No offensive smell on opening the abdomen; but the contents of the small intestines had a peculiar fusty faint sickening odour, generally met with in the discharges of this disease.
Urinary bladder empty, and firmly contracted.	Hands and feet deep blue.	

NAME, AND DURATION OF ILLNESS.	AGE.	BRAIN AND SPINAL MARROW.	CHEST.		STOMACH AND INTESTINES.
			Heart, &c.	Lungs.	
4 Crawford; ill 9 days; died 9th Nov. Examined after death 7 hours.	55	Not examined.	Heart flabby; right side loaded with black adhesive blood.	No effusion in the cavity of the chest. Lungs gorged with dark blood. Bronchiæ contained much bloody frothy mucus.	Externally. Small intestines livid; stomach contained a quart of dark brown fluid. Mucous coat red at the pyloric extremity; elsewhere pale yellow, softened, and easily removed with the nail. Small intestines the same; large intestines much contracted.
5 Dorothy Swinney; ill 56 hours; died 11th Nov. Examined 5 hours after death.	29	Dura mater vascular; sinus filled with black blood; arachnoid milky; vessels gorged; centrum ovale dotted with black blood; no fluid in ventricles.	Heart healthy; contained a quantity of thick viscid blood.	Lungs congested, dark red; no fluid in the cavities of the thorax.	Stomach externally vascular. Mucous coat vascular and corrugated. Intestines healthy. Stomach contained a grass-green fluid.
6 Mary Ramsay; duration of illness 26 hours; died 17th Nov. Examined 13 hours after death.	16	Dura mater highly vascular; veins and sinus distended with black blood; arachnoid milky; substance of brain full of black points; at the base serum 3j.	Right side of the heart loaded with black blood.	No effusion in chest. Lungs congested.	Stomach externally red. Mucous membrane much corrugated, the ridges bright red from ecchymosis; contained a yellowish green mucous. Small intestines pink, contained flatus, and a reddish turbid matter with flocculi.
7 Geo. Woods; died 2d Dec.	40	Vessels of dura mater very turgid; arachnoid with coagulated lymph on its surface; pia mater highly vascular; a quantity of dark blood oozed from the cut surface of the brain; serum 3v. or 3vj. in the base.	Heart leaden coloured; cavities loaded with dark blood; fibrin on the right ventricle; venæ cavæ much distended. some ecchymosis at the apex of the heart.	Lungs much congested; much old disease. Little or no serum in the cavities of the chest.	Stomach externally vascular, veins turgid. Mucous membranes thickened, and softened, easily removed with the nail; corrugated and ecchymosed; contained no fluid; duodenum full of a gruel-like fluid; jejunum and ilium empty. Large intestines contained a pus-like fluid, and flatus.
8 Margaret Liddell; died 2d December; 18 hours ill.	45	Dura mater vascular; arachnoid opaque; substance of brain vascular.	Heart loaded with dark blood; its muscular substance of a deep leaden hue.	Lungs healthy. Pleura void of moisture.	Stomach appeared as if it had been long immersed in water, pale and softened, contained meat, &c., and a brown looking fluid of the consistence of gruel. Small intestines contained a quantity of the characteristic fluid.
9 Susan Clark; 24 hours ill; died Dec. 9th. Examined 12 hours after death.	18	Head not examined.	Right side of the heart, pulmonary artery, and venæ cavæ, loaded with dark tar-like blood. Pericardium contained the usual quantity of fluid.	Lungs healthy, without engorgement.	Stomach externally healthy; contained some air. Mucous membrane softened and corrugated, covered with a strongly adhesive mucus; small intestines contained a similar fluid untinted by bile.
10 Rev. Mr. S—; duration of illness 22 hours; died 6th Dec.	40	Nothing remarkable in the brain; slight congestion of medulla oblongata. Spinal marrow healthy.	Heart rather soft; right cavities full of blood, but not distended.	Some engorgement posteriorly, especially of the right lung. Pleura healthy. Gullet, larynx, and tracheæ, healthy.*	Stomach healthy; some slightly red spots on its mucous membrane. Intestines healthy, void of contents.
11 J. Carr; duration of illness 12 hours. Examined 9 hours after death.	48	Dura mater reddish; arachnoid milky; sinus full of blood; medullary substance, when cut, displayed numerous orifices, from whence issued drops of dark blood. Cineritious substance natural. Spinal marrow perfectly natural, its veins somewhat distended.	All the cavities of the heart filled with black coagulated blood. Coronary veins distended.	Lungs gorged with black blood, crepitating, air-vessels contained frothy mucous.	Stomach externally natural. Mucous coat of a dotted redness, contained a quantity of mustard. Some vascularity in the duodenum. Large intestines lined with a whitish pul-taceous matter.
12 A woman who died in the stage of collapse residing at Newcastle.		Brain, spinal marrow, ganglions, and nerves, without lesion. Spinal marrow and brain firm.	Heart voluminous; right side filled with dark blood, which also loaded the venæ cavæ, and venæ azygos.	Lungs congested, particularly at the dependent parts; the blood easily removed by washing.	Stomach and intestines without lesion. Mucous membrane white. The whole canal lined with a creamy looking matter.

OTHER ABDOMINAL VISCERA.	EXTERNAL APPEARANCES.	REMARKS.
Peritoneum dry: no offensive smell. Omentum vascular. Gall bladder distended with dark bile; duct firmly contracted. Urinary bladder firmly contracted, unyielding, and empty.	Hands blue. Muscles tense.	
No effusion in abdominal cavity. Gall bladder distended. Spleen large and dark. A small quantity of pus-like matter in the pelvis of the left kidney. Urinary bladder contracted and empty.	Cheeks, nose, and upper lip purple. Arms and hands the same.	
No fluid in the abdominal cavity. Peritoneum natural. Kidneys contained some purulent looking matter. Urinary bladder firmly contracted.	Face somewhat livid, but plump. Nails of fingers had a central blue spot; of toes, pearly.	This patient died comatose, after complete re-action. She fell into a deep sleep, which terminated in complete coma.
Adhesion of the omentum and liver to the peritoneum lining the diaphragm and abdominal muscles; apparently recent. Liver gorged with black blood. Gall bladder full of black bile. Bladder contracted, contained urine 3 ij.	Eyes sunk; surrounded with a dark areola. Face livid. Tunica conjunctiva much suffused. Fingers and toes firmly contracted, corrugated, and livid. Nails blue.	For this and the following autopsy we are indebted to Mr. Torbock.
Abdominal cavity void of moisture. Omentum pale. Liver healthy, but gorged. Gall bladder distended with black bile. Bladder thickened, and contracted to the size of a fig; contained 3 ij. of muco-purulent fluid.	Eyes sunk. Countenance and extremities livid. Muscles most rigidly contracted.	
Urinary bladder firmly contracted against the os pubis, and empty. Gall bladder full of bile. Other viscera healthy. Peritoneum devoid of serous exhalation; felt gritty.	Person full and robust. Eyes somewhat collapsed, and surrounded with a dark rim. Countenance placid. Lips livid.	This patient was attacked with symptoms of Cholera on the 6th, and appeared to be recovering till the 8th, when violent symptoms returned, and she died in about 94 hours.
Liver gorged. Gall bladder full of dark bile. Vena portæ empty. Vena cava full of dark blood. Kidneys congested. Urinary bladder full of urine.	Subject plump. No coddled appearance of fingers. The nails were blue.	* This patient had great difficulty in swallowing. See the case, for which we are indebted to Dr. Brown.
Liver natural. Gall bladder distended; its ducts obstructed. Vena portæ and meseraic veins empty. Vena cava distended. Urinary bladder contracted to the smallest bulk.	Much sugillation. Extremities livid. Muscles extremely rigid; their margins strongly marked.	
Liver and spleen without congestion. Vena portæ empty. Gall bladder full of bile. Kidneys natural. Urinary bladder empty.		For this report we are indebted to Dr. Guilloz, of Paris. It is remarkable that in the three last cases the vena portæ was found empty. Our impression is, that in the other autopsies, it was in a similar state of congestion to the rest of the venous system; but we do not feel certain on this point.

TREATMENT OF CHOLERA.

THE treatment pursued in this town, at the commencement of the epidemic, corresponded as nearly as possible with the directions given in the writings of those who witnessed the disease in India. Early, however, in its progress, it was found that considerable modifications were requisite, to adapt it to the form witnessed in this country; especially in the effects derived from bleeding and opium, "the sheet anchors of the disease" as they are respectively termed by Orton and Annesley, in their excellent observations on the subject.

PRELIMINARY STAGE.

When a patient was attacked with the symptoms characterised as premonitory, the indications appeared to be, to restore the disturbed balance of circulation, to control irritation, and to restore healthy secretion. In accomplishing these objects the warm bath was eminently useful; and, where that could not be applied, immersion of the feet in water was substituted: where the circulation was weak, and the pulse quick, the administration of a diffusible stimulus — as a glass of hot brandy and water — was succeeded by a less frequent and fuller pulse: opium was given where much irritation existed, or where cramps appeared; but invariably we followed up these measures with from five to ten grains of calomel, administering about thirty grains of compound powder of jalap in mint

water an hour or two afterwards: when diarrhoea was urgent, it was combated by the usual means, but the discharges usually called for the exhibition of calomel. A most efficacious means of removing cramp was the application of mustard poultices over the parts affected. When acute pain was complained of in the "small of the back," the abstraction of blood was highly beneficial: in such cases the pulse, which was small, thready, and hard, became soft under the operation. There is great analogy between this stage of the disease, and what Armstrong so well describes as mild congestive fever: the two diseases require the same combination of remedies usually producing very opposite effects, but in this instance uniting in one result,—enabling the oppressed heart to carry on the circulation, by diminishing the quantum of its labour, and by exciting the organ to more vigorous efforts.

STAGE OF COLLAPSE.

A consideration of the symptoms and post mortem appearances of the cold stage of Cholera will show, that in addition to means for arresting the vomiting, purging, and cramps, there are two other indications, less obvious at a first view, but of much greater importance.

These are — 1st, To restore the disturbed balance of the circulation; and, 2dly, To remedy the morbid condition of the blood itself. It would be foreign to the objects of the present work to enquire into the relations which these changes bear to each other in point of time: suffice it to observe

that the obvious facts are, that the blood is accumulated in the system of the right side of the heart; that it is not propelled from the left ventricle with sufficient velocity; that it is darker and more tenacious than natural, and contains a diminished proportion of serum, and that the lungs are congested, and perform their functions imperfectly.

Indication 1st.—To relieve urgent symptoms.

The most powerful means of arresting vomiting, purging, and cramps, are, the administration of a large dose of laudanum in a glass of brandy, and the application of mustard poultices to the epigastrium, and to the limbs affected with cramp. The vomiting and purging, at least, generally yield to these means; but the cramp often continues, and only becomes alleviated when the other indications of treatment are fulfilled, or on the approach of a more perfect state of collapse. Some caution is requisite in the administration of opium and brandy, as the urgency of the symptoms is apt to induce us to repeat the dose at short intervals; and in some instances where it produced the best immediate effects—the patient passing into the febrile stage without much appearance of collapse—their accumulated effect has seemed, at least, to retard his recovery.

In cases where the collapse comes on early and severely, the countenance sinking rapidly and the limbs becoming cold and blue, the vomiting is rarely profuse, and the fluid and mode of its ejection resemble very exactly what occurs in *Pyrosis*.*

* “Burning pain extending over the epigastrium, accompanied with an eructation of watery fluid, usually insipid, sometimes acid.” — *Good's Nosology*, p. 26.

Nor is the suppression of vomiting attended with amendment of the other symptoms; the pulse will continue to sink, or remain imperceptible. Indeed, it seems more than questionable, whether the vomitings and cramps do not tend to diminish the remora of the circulation. These considerations have induced caution in the employment of opium in such cases; but when the spasms, vomiting, and purging, are the prominent symptoms, their employment in moderate doses, and combined with calomel, is highly beneficial. When the burning pain at the pit of the stomach occurs with severity, the exhibition of brandy tends to increase it, and the patients are very averse to its use — dashing away the cup, and calling for cold water. In such instances the brandy will be instantly rejected, while other milder fluids will remain. We have found port wine *negus* very agreeable to the patient in these cases. The other stimulants to be employed are, some of the essential oils, and ether; of the former, the oil of peppermint is the best, and with ether often allays the irritability of the stomach. The burning thirst seems to call for a liberal supply cold drink; and we never could observe that the gratification of this desire was injurious. A very usual drink was infusion of rice, acidulated with nitric acid, with or without a little brandy. After the purging and vomiting have been profuse, there is frequently a most distressing feeling of emptiness in the bowels, the abdomen being flat and retracted. The greatest relief is derived from the injection of some bland fluid as warm as can be comfortably borne: the quantity may amount to two quarts, or more. In some cases, where a sti-

mulus seemed requisite, we have injected the oil of turpentine, followed by warm water.

EXTERNAL HEAT AND FRICTION.

Of the modes of applying external heat, that of surrounding the patient with bags of hot sand or bran, hot bottles, bladders filled with hot water, &c. appears preferable to all others. The hot bath can rarely be applied to a Cholera patient except in an hospital; and it is with the greatest difficulty you can prevail on him to remain in the bath, from his extreme sensibility to external heat, even when his skin feels as cold as clay. The same objection applies to the hot air bath, which was tried in the hospital in the presence of a number of medical gentlemen. They were all satisfied that it did not answer so well as the hot bottles. The heat under the blanket was, indeed, considerable—exciting much complaint from the patient; but the surface of the body did not become warmer, — the evaporation of the profuse sweat seeming to keep down the temperature. The employment of friction is very useful in allaying the spasms. The moisture of the skin requires the hand to be covered with a warmed flannel.

The *second indication* in the treatment of this disease is to restore the balance of the circulation.

1st. *By bleeding.* — The magical effects observed to arise from bleeding in the practice of our Indian authorities, and the obvious accumulation of black blood in the venous system, induced us to employ bleeding with much confidence; but the results, in too many instances, disappointed our expect-

ations. Examples will be found amongst the following cases, in which it was employed under circumstances apparently favourable;—where there was evident oppression of the chest; where the cramps were severe, and the pulse was perceptible at the wrist. In several such instances, the blood flowed to the extent of from ten to twenty ounces without relief, and the pulse became imperceptible, and never returned. The case of C. J., communicated by Dr. Ogden; and that of Nurse Fairley, in which at least twenty ounces of blood were obtained without the slightest benefit; with some others which will come under the observation of the reader, and which appeared exactly to coincide with the description of cases in which the practice was most strongly recommended. When, however, the cramps were the most prominent symptom, and before coldness and lividity had appeared, the practice was attended with the best effects. The following affords a striking instance:—

John Wardell, aged 35, having felt general uneasiness the preceding night, was attacked, at 7 A. M. on the 13th of November, with vomiting, purging, and severe cramp. He was visited at 8 o'clock. We found the pulse full 96 in a minute; skin rather cold. At this moment he was attacked with violent cramps, affecting both legs and both arms. He vomited a little watery fluid: this occupied, perhaps, two minutes. On applying the hand to the arm, the pulse was *quite gone*. A vein was opened; the blood flowed slowly at first, but gradually in a fuller stream; the pulse returned, and continued to improve till we had obtained $\frac{3}{4}$ xvj. The pulse becoming weak, the bleeding

was stopped; brandy and water, with calomel, were administered: slight cramp and vomiting recurred occasionally; but re-action was quickly established, and the patient did well.

The object of the abstraction of blood being merely to relieve the circulation, by diminishing the load that overweighs the heart, it is obvious that it is quite essential to the success of the operation that the patient be placed in the horizontal position; at the same time heat and friction must be assiduously employed, and brandy exhibited according to circumstances.

2dly. *Emetics*.—It was remarked above, that collapse was rarely complete till active vomiting had ceased; and it was suggested that such vomiting, as well as spasms, might tend to obviate the remora of the blood. The following observation from *Holland's Enquiry into the Laws of Life*, p. 435., seems to bear upon this point:—“But if the vomiting be excessive, and frequently repeated, we have different results. The muscular exertion which the frame undergoes in a succession of expiratory actions has the tendency to equalise the distribution and increase the stimulating qualities of the blood.”

Whether the beneficial effects which have succeeded the use of emetics in Cholera are to be accounted for wholly on this principle, we will not at present further enquire; but we have testimony in favour of their use from various sources. The case of Amelia Phillips affords an example of a person rescued from a state of collapse, after the pulse had ceased at the wrist, by a full dose of ipecacuanha in brandy and water, which produced

energetic vomiting. Mustard was subsequently employed with the same view, on the suggestion of Dr. Smith, of Newcastle, from an analogy which he perceived between the symptoms of Cholera and those of persons asphyxiated by foul air in coal mines, for which the usual remedy is a large spoonful of mustard suspended in hot water. It appears well adapted to accomplish the object in view, as it unites a stimulant and emetic power.

The case of Tate, in the Cholera Hospital, treated under the direction of Drs. Macann and Lindsay, affords an example of the beneficial effects of this remedy. The case was very similar to that of Phillips; and, in each case, the emetic producing energetic vomiting, re-action followed. In that of Tate, the effect was more strikingly manifested; for the patient relapsing, was again recovered by the same means.

Mustard has been employed as a stimulant, where such a remedy has seemed requisite, in *other* periods of the disease. Its employment with this view, however, seems scarcely advisable, from its acting much more as a topical than a general stimulant. Where a diffusible stimulant is indicated in this (or perhaps any disorder), brandy or wine is probably the safest and best. The carbonate of ammonia is also useful; but when re-action is fairly established, the greatest caution is requisite even in their administration. When the pulse has become distinguishable, and heat has begun to be restored, the great object is to keep re-action within due bounds, and to confine it to the restoration of the natural secretions. With this view, we shall best promote recovery by limiting our interference

to a dose of calomel, and the administration of warm diluents, with enemata, as described in a former page. There is a period, even in Cholera, when it is our duty to *do nothing*; and, what is more difficult, to see that nothing is done by others. To return from this digression: the object in view being to produce energetic vomiting, it is almost a matter of indifference whether mustard or ipecacuan be employed for the purpose: perhaps the sulphate of zinc is as eligible as either: even tartar emetic has been given as an emetic in Cholera*, — though this remedy, from its contra-stimulant power, seems peculiarly inapplicable. It is also observed to have a tendency to produce irritation of the intestinal mucous membranes, when administered in pneumonia or other diseases.

In the majority of cases where autopsy was performed, we observed considerable hyperœmia of the mucous membrane of the stomach. On this account, mustard is, probably, on the whole, less suitable than ipecacuan; especially as, from its pungency, it is extremely difficult to induce the patient to swallow it. Another remedy remains to be mentioned under the head of emetics — *tobacco*.

This remedy was employed in Gateshead on the 28th of December, and subsequently. It suggested itself from some analogy perceived between Cholera and tetanus, in which, it is said, tobacco enemata have been successful. The patient on whom it was employed appeared in a hopeless state of collapse, and was without pulse at the wrist. An injection prepared from tobacco 3 ss. and water a pint, was

* Vide *Kennedy's History of Cholera*, p. 141.

thrown up : vomiting became more profuse, and a feeble pulse was distinguished at the wrist. Towards evening, the injection was repeated. The patient was able to walk about the next day, and did well. On the 29th we had an opportunity of witnessing the employment of this remedy in Gateshead. The patient was a girl, apparently about twelve years old. Her state certainly seemed very hopeless ; in fact, quite so. She was cold as clay, without pulse at the wrist, eructating rather than vomiting mouthfuls of clear water. The injection, in about twelve minutes, produced copious vomiting ; the pulse was just perceptible for a moment ; she was attacked with complete opisthotonos, in which she continued three minutes, when the muscles relaxed in *death*.

Indication 3d. — To remedy the morbid condition of the blood.

For this purpose various remedies have been proposed : — Galvanism, transfusion of blood, and the inhalation of oxygen and of nitrous oxide.

Of the former remedies we have no experience. Oxygen gas was employed in several cases. It generally seemed to raise the pulse for a few beats ; but this was quickly followed by a corresponding collapse. We are obliged to Mr. Torbock for a case in which it seems to have produced more decided benefit. The nitrous oxide was employed in two instances, and produced no marked effect. The pulse was perceptible in each of them, and it felt somewhat weaker during its use.

Under the same head we may include alkaline carbonates. They were used extensively, in conjunction with other means, by Mr. Torbock, and

appeared beneficial in relieving the gastralgic suffering. We have given the carbonate of ammonia with the same view, when a more stimulant remedy was requisite.

In conclusion, it will appear that, with a view to treatment, Cholera may be advantageously divided into two varieties.

The one characterised by active vomiting, purging, and cramps.

The other by the early aggression of collapse, with little vomiting and purging, but sometimes with dreadful spasms.

The *first form* requires the use of brandy and opium, to moderate the excessive action; and of friction and mustard poultices, to control the cramps, and excite action of the superficial vessels by friction or mustard poultices to the extremities, and by tight bandages of the affected muscles. In this open form, when the pulse is thready and the spasms violent, bleeding is employed with the greatest advantage. It must now be borne in mind that this type of the disease, if neglected, in a few hours terminates in a state of almost hopeless collapse.

The *second form*. When the collapse comes on suddenly and completely, if the patient is seen immediately, bleeding is advisable, and will often at once restore him; but if he has continued for some time in that state, our experience does not encourage the employment of the remedy.

It is in such cases that emetics seem to offer the only chance of restoring the circulation. It must be remembered, that it is *energetic vomiting* that is

required. We believe that ipecacuan, in brandy and water, is the best mode of producing it.

ON THE TREATMENT OF THE SECOND OR FEBRILE
STAGE OF CHOLERA.

The indications of cure in this stage are, 1st, To restore healthy secretion; 2dly, To moderate excitement; and 3dly, To guard against local congestion.

The *first indication* of treatment may almost be considered as included in the second, and practically they may be treated together. The facts to be constantly borne in mind are, that though the most profuse watery discharges have passed off, there is always in the bowels an accumulation of a pasty viscous substance, approaching in appearance to the character of gluten, and which, so long as it remains unchanged, will continue to produce irritation. Of this substance bile appears to be the proper solvent.

2dly. — That the secretion of bile and urine has been totally suspended. Of the latter it has been stated above, that it has continued suspended for four or five days; we may add, that in one case, that of Elliot, who was visited by Mr. Torbock, no urine was found in the bladder during ten days, as was ascertained by the repeated introduction of the catheter.

The first remedy then to be employed is calomel, combined with such other medicines as circumstances may require: it should be followed by an active cathartic, and for this purpose the compound decoction of aloes answers very well; we have

also usually administered some diuretic medicine, as the *sp. æther. with liq. ammoniæ acetat.* The diet must be most strictly guarded. Till secretion is restored, digestion will continue suspended; and the patient should be confined to the use of diluents, with a little wine, if great weakness exists. During this period much restlessness occurs, with some oppression of the chest; this will generally cease when secretion is restored; and it is necessary to be cautious not to administer opium, as it rarely produces any good effect, and tends to increase the disposition to congestion in the head; thus running counter to another important indication.

Indication 3d. — To obviate local congestions. The attention of the practitioner must be constantly awake to the peculiar tendency of choleric fever to produce affections of the head: the least appearance of stupor or of cerebral excitement must be combated by the usual means, depletion local or general. The head should be shaved, and cold lotions applied till its temperature is reduced; a blister should be placed on the nape of the neck, if the symptoms do not quickly yield. In addition to these means, much good is effected by acting on the secretions, and by endeavouring to establish an increased action in the vessels of the extremities, where the circulation is always languid in such cases. For this purpose mustard poultices to the calves of the legs and to the feet are very useful, in conjunction with external heat and friction. In other cases there is a tendency to inflammatory affections, subacute in character, of the viscera of the chest and abdomen, especially the mucous linings of the intestines: these are not so imme-

diately dangerous, but require strict attention. The latter terminate occasionally in a dysenteric state of the bowels. The affections of the chest are to be treated upon general principles.

When the secretions are restored, the febrile symptoms frequently assume an intermittent type ; in such cases the sulphate of quinine has appeared very useful, as also in restoring the tone of the stomach when digestion has continued imperfect.

It remains to mention, that the treatment of the spasms, when they continue to recur for a considerable period, must be directed to the removal of general debility, and those dyspeptic symptoms which are usually found to accompany them. The use of small doses of rhubarb, magnesia, and ginger, will commonly prove advantageous, with the exhibition of some warm carminatives, with or without laudanum, when the attack comes on. If the usual local remedies — friction, and compression by a handkerchief bound round the part — do not succeed, the application of a mustard poultice for 10 or 15 minutes to the affected limb will very generally give relief.

C A S E S.

CASE I.

The father of this patient died of Cholera on the 26th of October.

William Sprout, junior, æt. about 35, was admitted into the Infirmary on the evening of the 27th of October, in the following state:—Frequent vomiting and purging of a serous fluid, extremities cold, fingers contracted, nails blue, spasms alternately in his legs and arms, pulse perceptible at one wrist, countenance shrunk and expressive of terror, eyes deeply sunk in their sockets, and the surrounding integument of a deep blue colour, voice broken and whispering, moaning and jactitation continual.

Opium and brandy were given him, and a vein opened, from which, with difficulty, there were extracted about four ounces of thick black blood; he was placed in a warm bath at 120°, and immediately afterwards bleeding again attempted, but without effect. Within ten minutes after his having the bath he was colder than previously, and his pulse perceptible at neither wrist. Sinapisms were applied to the epigastrium and calves of the legs, and hot substances placed at various parts of his body; friction continually used, with small doses of brandy at intervals. Under this treatment he gradually improved, and on the following day the pulse was distinct, though still extremely feeble; the temperature of his body had risen to the natural standard

nearly; there had been no vomiting nor purging since the last evening, nor any urine passed since his admission to the hospital; and the cramps had ceased. Calomel and jalap were given him, and smaller doses of stimuli were continued. On the 29th he appeared dull and stupid, disclaimed any pain in the head; eyes rather diffused. Purgatives and enema repeated; blister to the epigastrium and nape of the neck. In the evening he passed some bile by stool, and vomited nearly a pint of fluid, apparently pus. On the 30th, the symptoms of the head affection were increased; and although no pulsation could be felt at the wrist, or in the præcordial region, yet he was with difficulty kept in bed; continually throwing himself about, moaning and biting the bed clothes. On the 31st he became comatose, lying on his back with his eyes open, pupils dilated, and insensible, and breathing stertorous. In the afternoon he died.

POST MORTEM EXAMINATION OF WILLIAM SPROUT,
ABOUT 12 HOURS AFTER DEATH.

The muscles of the inferior extremities were still in a state of contraction; the abdomen was drawn in. On opening the abdomen, a very small quantity of water escaped; the small intestines were inflated, and their vessels very much distended with blood; the colon contracted, and its coats thickened; the whole mucous membrane of the intestines was of a deep red colour—at one part much softened, and blood effused upon its surface. A quantity of green bile was present in the large intestines. The stomach

healthy, with the exception of a pretty considerable ecchymosed patch.

Gall bladder full of bile, which could be ejected by squeezing ; urinary bladder contracted exceedingly, and containing a minute quantity of whitish fluid.

The lungs were gorged with *red* blood ; the bronchial membrane red. Heart large and flabby ; right auricle and ventricle full of black fluid blood ; left ventricle and aorta empty.

On removing the skull-cap, the dura mater appeared universally smeared with dark blood, which had flowed from the rupture of the numerous vessels passing between the skull and dura mater. The dura mater itself appeared to be thickened, and its vessels turgid. At the vertex beneath the dura mater, on either side of the longitudinal sinus, for the space of an inch, there was a considerable deposition of fibrin. The veins of the pia mater were in a state of extreme congestion. On slicing the brain, the passage of the knife was immediately followed by a stream of blood, arising from innumerable minute vessels, which, on being wiped off, quickly reappeared. The ventricles contained about half an ounce of water. The base of the brain was in the same state of congestion, especially the pons varolii and medulla oblongata, which were both considerably *harder* than usual.

CASE II.

Elizabeth Turnbull, a nurse to the Infirmary, strong and healthy, about sixty years old.—At 1

A. M. on the 2d of November, she felt general uneasiness, and had some diarrhoea; at 4½ A. M., symptoms becoming violent, Mr. Penman, the house surgeon, was called. She was then labouring under the following symptoms: — Violent vomiting and purging of a gruel-like fluid; excruciating spasms of the muscles of the legs and arms, especially the former; pulse perceptible only at one wrist; extremities cold and livid; fingers and toes much shrunk; tongue cool; voice puerile; intellect perfectly clear. She complains of pain at the epigastrium, and calls urgently for cold water.

A vein was freely opened in each arm, and a few drops of treacle-like blood were obtained. External and internal stimulants were freely employed, but without effect. At 10 A. M., the cramps had nearly ceased; the skin was universally cold as marble, and, at the epigastrium, of a deep purple hue. From this time to 2 P. M., the period of her death, the only symptoms of life were a gentle heaving of the chest, and a rational answer being *whispered* when a question was asked.

This nurse assisted in removing the body of Sprout, junior, to the dead-house the preceding evening; she had no communication with any other Cholera patient.

CASE III.

R. Roddenby, æt. 35, shoemaker. — It is stated that the subject of this report had suffered occasionally from stomach complaints (dyspepsia). He had dined and supped on pork, but, it is said, not to

excess, and had not drank any fermented liquor. On Sunday, the 30th of October, at midnight, he was attacked with vomiting and purging of a fluid resembling water-gruel, and filled several chamber-pots; had violent cramps of all parts of the body, particularly of the different fingers and toes successively. The colour of the skin of the extremities was quite livid; nails blue; pulse imperceptible; voice, a whisper. The medical assistance he received consisted in the administration of brandy, æther, and laudanum. About 9 o'clock, A. M. on Monday, the spasms had quite ceased; the surface continued cold and covered with clammy sweat. He then complained only of pain in the region of the heart. At 12 o'clock, on being raised up, at his own request, he instantly expired. His attendants believe that he did not pass any urine. His mental faculties were perfect to the last.

EXAMINATION AT 8 A. M. 1ST NOV., 20 HOURS AFTER
DEATH.

Skin and extremities livid; nails blue; muscles most strongly contracted; fingers and toes, some firmly flexed, others as firmly extended; thorax did not contain a drop of serum; lungs posteriorly infiltrated with black blood—otherwise healthy. Pericardium devoid of serum: the venæ cavæ much distended with black blood resembling tar; the same was found in the aorta, and all the cavities of the heart; the blood was adhesive to the touch; and the ventricles, when laid open, looked as if treacle had been poured over them; right ventricle contained a large piece of coagu-

lated fibrin loose in the cavity ; muscular substance somewhat soft, and of a dull or leaden shade ; gall-bladder distended ; ducts empty. On passing a small blow-pipe up the cystic duct, it was found to be impervious, *and pressure on the gall bladder did not cause any bile to escape*. The obstruction was caused by a contraction half an inch long, beginning at the origin of the duct. The duodenal extremity was also contracted ; the bile was tenacious, and of a deep yellow colour (like syr. croci) ; liver healthy ; spleen natural, containing, perhaps, rather more tar-like blood than usual in its vessels.

Stomach.—The superior serous surface of a brown red, which extended to the cardiac extremity. The stomach contained some ounces of a fluid like gruel, though a little darker, being tinged with brandy, the smell of which was perceptible ; the mucous membrane was thickened and softened, so as to be easily torn by the nail, and, towards the pylorus, of a speckled redness ; the prominent parts of the corrugations exhibited a black tinge, as if a brush dipped in Indian ink had been passed along the ridges ; and some streaked marks of the same colour were observed in other parts. Duodenum contained a fluid similar to that in the stomach, but of a lighter colour ; and just at the entrance of the biliary duct a slight tinge of bile existed. On laying open the rest of the small intestines, the fluid assumed precisely the appearance of a thick solution of soap and water ; and when more fluid, of whey, containing numerous white flocculi. In the caput cœcum coli, the fluid had almost exactly the appearance of pus, but was not granular, but some-

what gelatinous in consistency. Arch of the colon much contracted, and contained some of the same matter, but in a less fluid state: urinary bladder hard and strongly contracted; it contained about two drachms of fluid of a faint urinous smell, but precisely like that contained in the upper part of the bowels; the neck of the bladder was strongly contracted; the kidneys were hard, and their vessels full of black blood.

Pancreas cut with more difficulty than usual, being remarkably firm.

Vena cava and iliac veins greatly distended with the same black blood.

The psoas muscles felt as hard as a piece of board. Permission to examine the head was not obtained.

CASE IV.

Nov. 7th, 11 A. M.—John Crawford, seaman (but has not been at sea for some years), was attacked early this morning with violent sickness and purging of a watery brown fluid, attended with cramps of extremities. He was deadly cold all over; eyes sunk; expression of countenance much altered; tongue moist, rather cold; voice husky; pulse imperceptible at the wrist, appeared in a complete state of collapse. He had immediately a glass of brandy with ʒj. of laudanum; heat applied to the surface.

Half past 12 P. M.—Expressed himself much better; felt warmer, and could now raise himself in bed; skin becoming moist and clammy; no pulse at the wrist; had retained the brandy; ordered it to be continued.

6 P. M.—Pulse perceptible; expressed himself better.

10 P. M.—Expressed himself better. Ordered mustard poultice to the epigastrium; had 10 grains of calomel, with a mixture of æther and laudanum; to continue a table-spoon full of brandy every half hour.

Tuesday 10 A. M.—Was drinking coffee on our entrance; felt himself much better; little sickness or purging; pulse small and just perceptible. Ordered the medicine and brandy to be continued. He continued much the same all day until 11 P. M. when he became much worse; pulse left the wrist; grew much colder. A blister was applied to the epigastrium. He gradually sunk, and expired this day, November 9th.

EXAMINATION OF THE BODY 7 HOURS AFTER DEATH.

External Appearances.

Countenance placid; skin warm and rather yellow; an eschar was formed over the epigastrium; skin of the hands corrugated; nails blue; muscles tense; tendons drawn; skin and subjacent membrane pitted on pressure.

Internal Appearances.

Chest.—Extensive adhesions of the pleura, of old standing, particularly that of the right side; no effusions; lungs gorged with dark blood; bronchial tubes filled with bloody and frothy mucus.

Heart.—Pericardium contained a small quantity of fluid: heart natural, rather flabby; right side,

with the cavæ full of black blood, and on pouring out the contents the ventricle still appeared as if covered over with molasses. On laying open the abdomen, peritoneum rather dry; no effusion; omentum highly vascular; small intestines exceedingly livid, especially the ilium; no offensive smell; liver healthy; gall-bladder distended, and its duct firmly contracted, so as to prevent any bile flowing on pressure; bile of a thick consistence, of a dark olive colour, almost black.

Stomach.— External appearance natural: on cutting it open it contained about a quart of dark brown fluid, smelling of brandy; mucous coat pale yellow, excepting at its pyloric extremity, where it was exceedingly vascular; the same membrane was soft, thickened, and easily removed by the nail, excepting at the pyloric extremity, where it was much firmer. Duodenum contained a mucilaginous brown fluid; mucous coat thickened and soft.

Jejunum full of brown fluid; ilium, mucous coat completely softened, of a dark red colour, and containing a reddish mucus; appeared decidedly inflamed, and became darker towards the caput cœcum; cœcum and colon also dark; the descending portion of the colon natural as to size, but at the commencement of the transverse portion it became suddenly contracted, and continued so down to the anus, particularly at the sigmoid flexure, where it contained a watery brown fluid.

Spleen natural; urinary bladder firmly contracted against the pubes, and unyielding on pressure; quite empty.

The head was not allowed to be examined, as they were on the point of burying the body.

The wife of this patient had diarrhoea, with cramps and prostration of strength, during her husband's illness : she recovered, under the administration of opium and calomel.

CASE V.

Mrs. H —, æt. 28, was in perfect health on Sunday morning, the 6th Nov.; at half past 11 A.M., at church, she was seized with dreadful pain in the stomach, and great coldness of extremities, rigors, with chattering of the teeth. On having three glasses of wine, and being placed close to a good fire, became so much relieved that she *walked* home to avoid delay in procuring a conveyance.

She was immediately put to bed; warmth was applied to the feet; and she was seized with severe cramps of the abdominal muscles, the legs being drawn up in agony. When these went off, they were succeeded with great restlessness and jactitation, throwing about of the arms, &c. The pulse was about 80, contracted and weak; the spasms of abdomen recurring at intervals. Blood was drawn to about 16 ounces, with great relief of the oppression of the chest and general uneasiness; it was at first somewhat dark, and became brighter as it flowed; the pulse became more full and soft; previous to the bleeding, tincture of opium and brandy had been administered. From half past 1 P.M., when the bleeding had been performed, the cramps of the abdomen never recurred. Brandy was continued in small quantities, and a cup of coffee given. About 3 o'clock sickness and faint-

ness came on; and though brandy and laudanum were freely administered, the pulse became extremely weak, and beating 50 in a minute, with great coldness. Vomiting succeeded this state; the fluid vomited was partly a clear mucous liquid, with brandy and coffee, and partly a dark brown matter, which fell down and adhered to the bottom of the basin. The faintness* being removed, was succeeded by violent cramps of the arms and of the left leg, the calf of which felt like a hard ball. These symptoms were attended with excessive pain. A mustard poultice being applied to the affected leg, after 20 minutes produced much pain and redness; the spasms never returned in that part.

4 P. M. — Up to this hour she had taken

Brandy about \bar{z} vj.

Laudanum \bar{z} iij.

Æther \bar{z} ij. or \bar{z} iij.

Wine heated with spices \bar{z} iv.,

in addition to that administered in the vestry of the church. The pulse continued weak, and after the spasms came on continued with great regularity at 76 per minute. At this time the spasms diminished in frequency and severity, and a distressing hiccough came on, for which the æther was administered without relief; a mustard poultice was applied to the epigastrium, and in less than 11 minutes the hiccough ceased. The vomiting returned at intervals, but was not profuse; calomel grs. vj. was given at 5 P. M., and an hour afterwards rhubarb with magnesia and aromatics: the spasms had totally ceased by 8 o'clock: beef tea was given,

* The relief of the faintness, and rising of the pulse, when the vomiting came on were immediate.

with occasionally *negus* ; and about 1 o'clock she fell into a tranquil sleep, which, with slight intervals, continued through the night. Injections of castor oil, warm water, and oil of mint, were three times administered, which appeared to produce increased comfort and feeling of warmth : the bowels were not freely relieved till the morning, as the injections returned unchanged ; but the dejections were quite natural, and the bowels had been in a quite healthy state for some days.

CASE VI.

Nov. 7th, Elizabeth Short, æt. 45.—Had suffered in the afternoon from *distension* of the *bowels* and general uneasiness ; for which she took calomel, extract of colocynth, and salts with infusion of senna.

At 10 p. m. she had had copious dejections of bilious fluid, with vomiting of a clear mucous or watery fluid very profuse ; severe cramps of abdominal muscles and limbs ; skin cold and livid ; tongue cold, moist, and slightly furred ; great restlessness, anxiety, and jactitation. Pulse 100, a mere thread ; voice a whisper.

R Tinct. Opii ʒj.

Brandy ʒj.

was instantly rejected, and repeated. Cataplasma sinapeos epigastrio : heat applied externally.

11 p. m. — Mustard poultice had not produced any effect ; ordered to be repeated. Venesection to ʒviij., when faintness came on ; blood of two distinct colours, a black and a crimson stream side by side.

Ordered pills of opium, calomel, and camphor.
A mixture with æther, laudanum, and mint.

Brandy $\frac{3}{4}$ ss., every half hour.

Nov. 8. 7 A. M. — Brandy had been constantly rejected; purging less violent; pulse at wrist imperceptible; limbs cold and damp; face dark and livid; eyes sunk: nothing would remain on the stomach: appears to be dying. She continued in this state till the evening, vomiting the brandy, which she now refused: she passed at 6 P. M. a little urine. Ordered port wine boiled with nutmeg and sugar.

9. 8 A. M. — Had taken about $\frac{1}{2}$ j. of the port wine; felt easier; quite rational; voice a whisper. Ordered calomel grs. x., pulv. rhei grs. xv., and an injection of turpentine and ol. ricini, to be followed by warm water $\frac{1}{2}$ iij.

7 P. M. — Injection returned unchanged; some stupor.

10. — Died in the evening at 12 P. M.

EXAMINATION AT 9 A. M., 11TH Nov.

External Appearance.

Nails and fingers deep blue, rest of the skin natural; belly tumid, from fat two inches and a half thick over the abdominal muscles. Perpendicular dimensions of chest contracted by the great arching upwards of the diaphragm.

Lungs highly congested, crepitating; venæ cavæ distended with black blood. Heart natural; right ventricle much distended.

Abdomen. — Stomach externally natural; mucous

membrane softened, and, towards the cardia, vascular; it was corrugated in strong lines: there was an appearance of slightly superficial ulcerations or abrasions, but somewhat indistinct; others in the duodenum, on a slightly elevated base. Gall bladder firmly contracted on a number of large biliary concretions, and having an unnaturally firm fibrous appearance. No bile.

Urinary bladder empty, and contracted like a fig.

N. B.—This patient had a severe attack of jaundice in May, 1830, previously to which period she was in the habit of drinking gin, but not to excess; but it is stated that she had entirely given up the practice since her illness in May, 1830.

CASE VII.

Nov. 13.—Amelia Phillips, æt. 30, Sailor's Alley; attended the funeral of Dorothy Swinney, who died of Cholera; was attacked at 3 A.M. with purging, succeeded by vomiting of a watery fluid, and violent cramps of extremities. No medical assistance was obtained until 11 A.M., when bleeding was attempted, but without effect.

Half past 12 P.M. — Skin cold and of a mottled purple; eyes sunk and surrounded with a dark rim; pulse imperceptible; tongue moist and rather cold; some stupor. Purging and vomiting had ceased; cramps trifling. A vein was opened in each arm, and a little tar-like blood flowed out; an emetic of ipecacuan in hot brandy and water was given; in 4 or 5 minutes full vomiting was produced, when the pulse gradually returned at

the wrist, and the blood flowed improved in colour; 10 ounces were obtained: in half an hour she became warmer, and re-action was established.

Calomel and other medicines were given, which produced free feculent discharges during the 14th.

15th. — Has some vomiting; pulse 100, small; tongue furred and moist; has had several loose dejections; complains of tightness across the chest and pain in the right hypochondrium.

V. S. ad $\bar{3}$ vij.

felt relieved.

Emp. Lyttæ Epigast.

R Tinct. Opii, \mathfrak{m} xxx.

Aq. Menth $\bar{3}$ j. \mathfrak{m} s. s.

Rice water for common drink.

16th. 9 A. M. — Slept tolerably well; has had two loose bilious dejections, and passed a good deal of urine; less thirst; pulse 92; tongue clean and moist; skin cool; has vomited a little bilious fluid; has frequent eructations, and yawning; complains of lightness of the head.

R Magnes. Carb. $\bar{3}$ ij.

Aq. Menth. $\bar{3}$ vij.

Sp. Æther Nit. $\bar{3}$ vj., \mathfrak{m} s. $\bar{3}$ j. tertiâ horâ.

Sago and barley-water.

2 P. M. — Sickness still continues; tongue clean and moist; pulse 86; skin moderate; thirsty; passed some urine; has had one yellow dejection.

6. P. M. — Much the same.

Rep. Mist. cum additione T. Opii \mathfrak{m} xxv.

10 P. M. — Restless; vomiting severe.

R Opii grs. ij statim s.

17th. 8 A. M. — After 12 o'clock slept well; vomiting continues at intervals; much thirst; tongue coated towards the root; pulse small, 92; skin natural; has had two loose bilious dejections, and passed a little urine. To have barley water lbj. Acid Nitric ʒ ss. ℥ for common drink.

Half past 3 P. M. — Vomiting frequent, of a greenish fluid; has had two dejections; tongue moist; pulse small, 90; thirst continues. Wishes for weak brandy and water (ordered).

9 P. M. — Has slept at intervals; vomiting not so violent; skin coldish; pulse 84, small; bowels have not been moved; blisters, although repeated, have not risen.

R Calomel grs. iv.

Opii grs. ij. ℥ F. Pil. statim s.

Sago and weak brandy and water.

18th. 9 A. M. — Has passed a restless night; vomiting constantly a clear fluid; tongue clean and moist; skin natural; pulse 80; has had three dejections. Wishes for ale (ordered).

3 P. M. — Vomiting excessive; bowels not been moved; has passed no urine.

R Calomel grs. ij.

Opii gr. j. F. Pil. statim s.

Beef tea.

9 P. M. — Vomiting not so severe; skin natural; pulse 80; tongue moist; has had two dark dejections; no urine.

Rep. Pil. Calomel. cum Opio. h. s. s.

19th. 9 A. M. — Has passed a restless night; vomiting continues; skin on arms purplish and cold; pulse 76, small; tongue moist; thirsty; hiccough troublesome; has had one brown dejection; passed a little urine at twice.

Rep. Pil. Calomel. sine Opio, statim s.
Mist. Magnes.

4 P. M. — Sleeping.

9 P. M. — Exceedingly restless; skin moderately warm; pulse 76; tongue moist; vomiting not so severe; had one brown dejection resembling paint; no urine; hiccough rather troublesome; moans frequently, but says she has no pain.

R Opii grs. ij. horâ somni s.

Barley water and brandy, during the night, with the beef tea.

20th. 9 A. M. — Rested quietly all night; vomiting almost entirely abated; skin natural; pulse 86; tongue rather dry and brown; some stupor; had one bilious dejection, with some urine.

R Ol. Ricini \bar{z} ss.

Sp. Æther. Nit. \bar{z} ij. statim s.

Continue brandy, beef tea.

1 P. M. — Was seen by Drs. Barry and Daun. Much stupor: Dr. Barry ordered the following:—

R Ammon. Carb. \bar{z} ij.

Conf. Aromat. \bar{z} j.

Mist. Camph. \bar{z} v. ss.

P. Opii xl. η . η \bar{z} ss. omni horâ.

Emp. Lyttæ. Regione Lumb., and to continue brandy and beef tea.

Half past 2 P. M. — Refuses the medicine.

Half past 5 P. M. — Appears to be sleeping ; skin coldish ; pulse small, 72 ; had one dejection ; no urine ; is exceedingly weak.

Cataplasm Sinapeos Epigast.

Half past 10 P. M. — Great stupor ; skin cold, mottled purple over the back of the hands and arms ; pulse hardly perceptible ; tongue coated ; no dejection ; no urine.

Cont. omnia.

21st. — Continued perfectly quiet until 4 A. M., when she became restless ; moaned. At 7 she rallied, talked incoherently, but soon sunk again, and died quietly at 10 A. M. She had support every quarter of an hour during the night, with warmth constantly applied over the whole surface.

External appearances, half an hour after death : — Skin of the face yellowish ; eyes deeply sunk ; arms and hands blue ; nails blue, the right arm the most ; fingers not corrugated nor contracted ; skin of feet slightly discoloured ; nails not blue, rather pearly ; tendons stretched ; ankles prominent.

CASE VIII.

Nov. 15th. — Anne Findley, æt. 33 ; admitted at 4 P. M., was taken ill at 3 A. M. with violent vomiting and purging, and dreadful cramps ; the evacuations resembled water gruel. At the time of admission she was perfectly collected ; voice husky ; eyes dull and sunk ; skin cold and bluish ; pulse gone at the wrists, and could hardly be felt

over the region of the heart; no vomiting and purging, but great thirst: heat was applied to the surface, by means of flannels wrung out of boiling water, wrapped round the limbs, which were then covered up. Brandy and laudanum were given immediately.

Half past 5 P. M. — Skin warmer; pulse perceptible at the wrists, small, and about 120; cramps occasionally, but not severe; on putting the finger down to the back part of the fauces, it produced no vomiting, but a cold current of air rushed over it at each expiration; respiration slow, but not difficult.

R Calomel grs. x. statim s.
Hot brandy and water.

Half past 6 P. M. — Vomited once since admission, a dark fluid which smelt of brandy; complains of pains over the abdomen; skin becoming damp; pulse small; V. S. ad $\frac{3}{4}$ x.; blood black, and dropped from the arms; after the first $\frac{3}{4}$ iij. pulse rose; after $\frac{3}{4}$ v. it suddenly became less perceptible.

11 P. M. — Pulse hardly perceptible; skin of arms damp and cold; chest warm; tongue and mouth warm; countenance collapsed; some retching.

Rep. Calomel. Nitric acid drink.

16th. 9 A. M. — Has passed a restless night; after 12 became colder, and covered with clammy sweats; had some wandering and some retching, but did not vomit; had three loose bilious dejections; took barley and rice water, with a little brandy. Pulse small and frequent; tongue foul

and dry; much thirst; respiration easy, rather slow; voice improved; skin natural; pupils contracted, but says she has no pain of head; her intellect is clear; cramps of legs at intervals; has passed no urine since admission. Blood drawn last night scarcely coagulated, and spots of fibrin visible, of a leaden colour; no serum.

2 P. M. — No pain; pulse distinct 100; chest warm; arms not so warm; tongue dry and furred; has had six reddish-brown dejections; no cramps; countenance much improved; thirst less urgent. To have sago and lemonade at intervals. Catheter introduced, but no urine in the bladder.

4 P. M. — Passed about $\frac{3}{4}$ iv. of colourless urine.

10 P. M. — Feels cold and exhausted; has had several brown dejections. To have hot brandy and water.

11 P. M. — Feels more comfortable; tongue cleaner; passed a few drops of urine.

R Tinct. Opii \mathfrak{m} xxv.

Aq. Ment. \mathfrak{z} j. F. Haust. h. s. s.

17th. 8 A. M. — Has passed a restless night; tongue foul; no pulse at the wrists; no vomiting; has had two loose bilious dejections, tinged with blood, very offensive; no urine. To have brandy and water.

3 P. M. — Pulse slightly perceptible; bowels have not been moved. Continue brandy and water.

9 P. M. — Much exhausted; skin cold. Pulse again imperceptible; respiration laborious; arms and chest livid; eyes sunk and dull; has had one dejection; has passed no urine. Continue the brandy and water.

18th. Half-past 3 A. M. — Was attacked with furious delirium after midnight; got out of bed, and was restrained with much difficulty. At present her countenance is death-like; pulse imperceptible; respirations 11 in a minute; arms purple; nails blue; constant jactitation.

Died at 6 A. M.

CASE IX.

Nov. 16th. — Mary Anne Nicholson, æt. 20, Chancery Lane: has a child 5 months old, whom she was nursing; admitted at 3 P. M., having been attacked with vomiting, purging, and cramps in the morning. At present, countenance not much sunk; skin warm on the chest; arms and legs cold; hands shrivelled; tongue moist and rather cold; pulse 120, small; vomiting abated; purging continues; urine suppressed. Heat was applied to the surface: hot brandy and water was given, and the following

R Calomel grs. vj. statim s.

R Tinct. Opii ʒ ss. Aq. Menth. ʒ j. F.
Haust. postea sumend.

5 P. M. — Complains of great pain in the chest, under the right breast. V. S. ad ʒ iv.; blood like thin currant jelly. Emp. sinapeos. p. affect., by which the pain was relieved in the chest.

9 P. M. — Felt a sudden pain in the chest, under the left breast. V. S. ad ʒ v.

Emp. Sinapeos. p. affect.

R Calomel grs. v.

Pulv. Rhei. grs. x. Ol. Menth. grs. iij.

F. Pulv. statim s.

Sago and rice water.

17th. 9 A. M. — Has had a good night ; pain in the left side of the chest continues ; skin warm ; tongue rather furred ; has had two dejections, — first watery, second bilious.

Emp. Lyttæ. part dolenti.

Half-past 3 P. M. — Skin warm ; tongue furred ; pulse 120, rather full ; has had four bilious dejections ; no urine. To have sago.

9 P. M. — Feels much better ; some pain in the head ; light affects the eyes ; tongue moist ; pulse 124 ; bowels moved twice ; has passed a little urine ; pain in side better.

R Calomel grs. iij.

Pulv. Opii. gr. j. F. Pulv. h. s. s.

Sago and rice water.

18th. 9 A. M. — Has had a good night, and feels much better ; blister applied yesterday morning has not risen ; pain in side gone ; voice strong ; pulse 108 ; tongue slightly furred and brown ; no thirst ; had one dark dejection in the night ; passed some pale urine.

R Pulv. Rhei. grs. xij.

Jalapæ grs. vj. Ol. Menth. grs. ij. F.

Pulv. statim s.

Diet as before.

3 P. M. — Much the same ; bowels not moved ; passed about a pint of brownish urine.

9 P. M. — Feels better ; tongue moist and brown ; pulse 108, rather full ; skin rather above the natural temperature ; perspiration after taking the ale*, with giddiness of head ; bowels moved once ;

* Nurse had given her some ale, at her urgent request.

has passed urine frequently ; no secretion of milk since the date of the attack ; feels a desire for food.

Omit the ale, and take instead barley-water.

19th. 9 A. M. — Has passed a good night ; tongue brownish ; pulse 108 ; skin on arms coldish ; otherwise feels warm ; thirsty ; has had one small dejection, and passed plenty of thick yellow urine ; head still giddy.

R Ol. Ricini ʒvj.

Sp. Æther Nit. ʒij. statim s.

Beef tea.

4 P. M. — Has had two brown dejections, with a sufficient quantity of urine ; head very giddy.

Abradatur caput, et lavatur lotionē frigi.

Half-past 9 P. M. — Head feels easier ; not much thirst ; tongue moist ; pulse 100 ; has passed, at one time, a large quantity of dark tenacious matter from the bowels.

20th. 10 A. M. — Good night ; giddiness gone ; feels better ; pulse 108 ; skin natural ; tongue moist and brown ; has had one dark dejection, with some urine. Left breast hard, but contains no milk : to have it well rubbed with warm vinegar.

R Mist. Magnes. ʒvj. : ʒj. tertiâ horâ.

Beef tea and gruel.

10 P. M. — Feels much better ; bowels freely opened ; urine copious.

21st. 10 A. M. — Slept well ; no pain ; eyes

bright; pulse 80; tongue moist and clean; skin natural; no dejection; urine plentiful.

Rep. Mist. Magnes.

Beef tea and boiled milk.

10 P. M. — Had a violent pain over the lower part of the abdomen, which was relieved with warm fomentations: frequent desire to pass urine; has had one bilious dejection; skin hot; pulse 96, with a slight intermission; much thirst.

Rep. Pulv. Purgans.

22d. 10 A. M. — Slept well; feels better; has had one large solid dejection, of tenacious pasty consistence; urine natural: says she has an appetite. Rice pudding.

Half-past 9 P. M. — Eat her pudding with an appetite, and felt no worse after it.

23d. 10 A. M. — Passed a good night; says she is quite well; breasts rather troublesome; catamenial discharge has appeared.

Rep. Mist. Magnes.

24th. 9 A. M. — Feels quite well.

Convalescent.

CASE X.

Nov. 16th.* — Anne Nicholson, æt. 13 (sister of Mary Anne Nicholson), had vomiting and purging,

* Mrs. Nicholson, the mother of the above and Mary Anne Nicholson, was employed in laying out the body of Dorothy Swinney, who died on the 10th instant; her children, four in number, were attacked with Cholera on the 15th and 16th; on the 16th she had also diarrhoea, with slight febrile symptoms; she took laudanum ʒj; brandy ʒss; which stopped the purging. She had no other indisposition.

which commenced at 8 A. M. this day; was admitted into hospital at 3 P. M. with general coldness of the body; cramps in the feet; pulse 120, scarcely perceptible; tongue moist; countenance sunk, with a dark areola surrounding the eyes; skin cold and livid; hands dark blue; great jactitation; vomiting of a whey-like fluid, with flocculi; suppression of urine.

Brandy $\frac{3}{4}$ ss. statim; dry heat to surface, and constant friction with hot flannel.

Brandy in rice water to be constantly given in small quantities.

9 P. M. — Vomiting continues, also the jactitation; feels rather warmer, but it is difficult to keep constant warmth applied from her restlessness.

Hab'. Calomel grs. iv. statim s.

Half past 11 P. M. — Vomiting continues with excessive thirst.

R Mist. Magnes. $\frac{3}{4}$ ss. tertia quaque horá. To have barley-water, with brandy and tea.

17th. 8 A. M. — Slept a little; vomiting continues of a clear fluid; pulse 120; tongue moist and clean; some cramps of left arm; pain in right hypochondrium: passed a little urine in the night.

Cont. Mist.

Rep. Calomel grs. iv.

Half past 3 P. M. — Vomiting continues; pulse feeble; has had one dejection of watery fluid.

Catapls. Sinap. Epigast.

Brandy and water.

9 P. M. — Chest warm; arms and hands cold;

vomiting continues ; tongue moist ; pulse small, 136 ; has had one watery dejection ; no urine.

R Calomel grs. iij.

Opii gr. i. F. Pulv. h. s. s.

Cataplasm Sinap. Pedibus.

18th. 9 A. M. — Passed a restless night ; much vomiting of whitish fluid ; three ochrey dejections ; no urine ; thirst excessive ; pulse 120.

R Pulv. Rhei.

Magnes. āā grs. x.

Ol. Menth. grs. ij. F. Pulv. statim s.

Emp. Lyttæ Epigast.

Barley-water with brandy ʒj. — pro potu communi.

3 P. M. — Jactitation ; skin cold ; pulse small ; bowels not moved ; constant vomiting, until within half an hour ago.

9 P. M. — Sleeping ; vomiting has been less severe ; has had two brown dejections ; pulse 104, more full ; skin warmer ; passed some urine.

Beef tea.

19th. 9 A. M. — Restless all night ; thirst excessive ; skin warm ; tongue brown and dry ; pulse 108 ; vomiting not so severe ; matter vomited rather yellowish ; bowels have not been moved ; no urine.

R Ol. Ricini ʒ ss.

Sp. Æther Nit. ʒ ij. statim s.

11 A. M. — Passed about 1½ iss. of brownish urine.

R Hyd. Subm. grs. ij. statim s.

4 P. M. — Sleeping.

9 P. M. — Complains of pain in the head; skin hot; face flushed; tunic conjunctiva injected; light affects the eyes; pulse small; not much thirst; tongue moist; vomiting trifling; has had one watery dejection; passed about a gill of clear urine.

Hirud. xij. Temporibus.

20th. 9 A. M. — Passed a good night; complains of pain in the small of the back; head still painful; tongue rather dry; skin warm; pulse 88; has had two watery dejections, and passed some urine.

Rep. Mist. Magnes. cum Sp. Æther Nit.
Gruel.

10 P. M. — Sleeping; no sickness; has had one dejection, with urine.

Cont. Mist.

21st. 10 A. M. — Has had a good night; feels better; eyes brighter; tongue moist and clean; pulse 76; skin natural; has had two brown dejections, with urine.

Rep. Mist. Magnes.
To have beef-tea and boiled milk.

10 P. M. — Complains of pain in head; skin hot; tongue rather dry; has had two dejections, with urine. Cold lotions to the head.

22d. 10 A. M. — Has had a good night; skin warm; pulse 84; tongue clean and moist; no

thirst: says she has still pain in the head; face flushed; urine plentiful; no stool.

Hirud. viij., Temporibus.

Emp. Lyttæ Nuchæ.

R Hyd. Subm. grs. ij.

Pulv. Rhei. grs. viij. statim s.

Gruel and barley-water, omit the beef-tea.

9 P. M. — Head became so much better that the leeches were not applied; flushing of the face gone; tongue moist; pulse 82; had one plentiful thick dejection; urine natural and plentiful; blister rose well, and discharges copiously.

Gruel.

23d. 10 A. M. — Has had a good night; no pain in head; pulse 96, rather full; face slightly flushed; had one dejection, with urine copious.

Rep. Pulv. ut heri.

8 P. M. — Continues better; bowels have been freely opened.

24th. 9 A. M. — Slept all night, and says she is quite well; eyes bright; tongue clean; good appetite.

Rice pudding. Convalescent.

CASE XI.

Nov. 28. — Mrs. Wardle, æt. 40, wife of Ralph Wardle, who had the disease on the 13th instant, was this morning employed in laying out the body of a girl, who died of Cholera; was attacked about three hours afterwards, with vomiting and purging of a brown watery fluid, followed with severe

cramps of the abdominal muscles and those of the extremities : was seen at 4 P. M., about an hour after the attack ; cramps severe ; vomiting constant, skin damp and cold ; tongue moist ; eyes sunk ; pulse small and feeble ; complains of great thirst.

Hab'. Pulv. Ipecac. \mathfrak{z} ij. statim s.

and was followed immediately by weak warm brandy and water.

Vomiting became full and free ; pulse improved.

V. S. ad \mathfrak{z} xij.

Felt relieved.

To apply warmth and frictions to the extremities.

Hab'. Calomel grs. x. statim s.

R Tinct. Opii g. xij.

Aq. Menth. \mathfrak{z} j. pro Haust. statim s.

Ordered to have warm diluents and weak brandy and water.

7 P. M. — Purging has ceased ; vomiting less severe ; pulse feeble ; skin rather cold ; restless.

R Ammon. Carb. \mathfrak{z} ij.

Aq. Menth. \mathfrak{z} v. ss.

Tinct. Cardam. C. \mathfrak{z} ss. \mathfrak{m} \mathfrak{z} j., omni hora si opus sit.

10 P. M. — Feels better, but is troubled with cramps occasionally ; skin warmer ; pulse improved.

Cont. Mist. P. R. N.

29th. 9 A. M. — Has passed a restless night ; pulse frequent ; tongue dry in the middle ; skin rather

hot; no dejection; complains of severe pain in the forehead, of sickness, and of pain on pressing the epigastrium.

R Pulv. Rhei } āā ʒj.
 — Jalapæ }

Magnesiae ʒj.

Aq. Menth. ʒ vss. M. ʒ jss. 2dā horā.

7 P.M. — Is in every respect much improved; bowels have been freely moved, and she has passed a large quantity of dark brown tenacious matter.

R Calomel. grs. vj., h. s. s.

Cont. Mist. cras mane.

From this time she continued to improve rapidly, and was well in a few days.

CASE XII.

Nov. 16th. — Mary Ramsey, æt. 17, Wood Street, was attacked early this morning with violent vomiting and purging, with cramps of the extremities. Admitted into hospital at half-past 2 P.M., at which time the skin was deadly cold and livid; eyes sunk, surrounded with a dark areola; jactitation; no pulse could be found in any of the arteries; has no vomiting or purging; urine suppressed; moans constantly; stupor; great thirst. Heat was applied over the surface; hot brandy and water were given, and constant frictions with hot flannels saturated with spirits of turpentine.

6 P.M. — Has been in a profound sleep for the last two hours, with laborious respiration; head and chest warm; extremities becoming so. Under an idea that she was in a state of narcotism, cold

water was dashed over the face and chest; she was forcibly shaken, and at length roused; spoke correctly, but instantly fell off again; the finger was introduced into the pharynx, but did not excite vomiting: exertions to rouse her were continued until 8 P. M., when an emetic of pulv. ipecac. 3 ss. was administered, with weak brandy and water; and at half-past 9, tart. antimon. grs. iij. were given, still without effect. During all this time the pulse never returned at the wrist.

10 P. M. — Moans constantly; skin cold, in spite of every exertion to keep up its temperature.

11 P. M. — Complete coma. Died a little after midnight.

POST MORTEM EXAMINATION 13½ HOURS AFTER-
WARDS.

The countenance placid; the face somewhat swollen, covered with light purple spots, which extended into patches on the neck and breast; eyes did not appear much sunk; hands and feet were of a natural colour; the fingers were bent and huddled together; the nails of the fingers had a central blue spot; the muscles of both extremities were rigid; the flesh of the body firm and plump; skin not discoloured, except on the abdomen, where a mustard poultice had been applied; the belly was diffusedly tumid.

On separating the scalp from the skull, a small quantity of dark blood issued from the vessels; the tearing back of the skull-cap was followed by a considerable quantity of blood (black and viscid). The longitudinal sinus was found distended, with blood of the same consistence and colour; the

arachnoid membrane, where it covers the upper surface of the hemispheres of the brain, was in parts very slightly opaque; the veins of the pia mater beneath it, especially to the back of the head, were seen gorged with the same black blood; which contrasted with a general florid redness spread over the whole surface of the brain, arising from the increased number of capillaries carrying arterial blood. The substance of the brain was firm; and thin slices of it presented many dark points, which, when pressed, gave out each a minute drop of blood (venous). A few drops only of clear serum escaped from the lateral ventricles, which presented nothing unusual, except, perhaps, that the choroid plexus was somewhat larger and more vascular than in health. The sinuses, veins, and cerebral surface at the base of the brain, resembled those on its upper half, except that the arachnoid here was perfectly transparent: an ounce of serum had fallen to the base. The interior of the cerebellum presented the same appearance as that of the brain.

The cellular membrane above the abdominal muscles was fatty. On opening the parietes of the abdomen, and looking at the viscera in situ, the whole intestines were distended; partly, as afterwards appeared, with air, and partly with a reddish turbid serum, containing albuminous floculi, but no fœculent matter. There was no effusion of serum into the abdominal cavity; no change in the peritoneum. The small intestines were, outside, of a reddish colour; that of the large, was of greenish white: the omentum was somewhat fatty, and tinged by arterial vascularity.

It should be mentioned, that five or six inches of the transverse arch of the colon formed an exception to the general distention of the intestines, and was contracted, though not very much. The stomach, externally, was slightly and partially red; it contained three or four ounces of a green and yellow matter, having a mucilaginous consistence. The mucous membrane was thrown into elevated rugæ, chiefly longitudinal; and the ridges were beautifully tinged by crimson stripes, which, when minutely examined, turned out to be the effect of ecchymosis: in the interval, the mucous membrane was, perhaps, thickened, but otherwise healthy. The mucous membrane of the duodenum, and of half of the jejunum, was thickly studded by minute tumours, half the size of small peas, which were solid when cut; their seat was in the submucous tissue, and their colour was that of the mucous membrane itself. The mucous membrane of the small intestines was reddish, and very slightly ecchymosed: the large intestines were healthy; the liver was of a healthy consistence and uniformly red colour; the gall bladder contained three ounces of a yellowish green bile, which flowed readily into the bowel when the gall bladder was pressed; the spleen and kidneys were healthy, except that a few drops of white purulent matter were squeezed out of the uriniferous tubes of the right kidney: the bladder was contracted into a small hard mass, about the size of a fig; its mucous membrane was white; it was quite empty.

The heart was healthy: it contained a considerable quantity of viscid black blood; but how much, or in which of the cavities, could not be known,

as it was accidentally cut into in the former part of the dissection. The lungs crepitated every where, and yet were firmer than is natural; they were uniformly of a dark red colour: no fluid came from the bronchiæ; they were neither hepatised nor tuberculated; slight adhesions bound the left to the ribs: no serum was effused into the chest.

The spinal marrow and visceral ganglia were not examined.

CASE XIII.

Nov. 26th. — John Hirkin, æt. 40, hatter. Intemperate habits. Was first seen at 9 A. M., at No. 9. Mill Street (a lodging house), in a wretched state. He stated he had been seized at 3 A. M. with violent vomiting and purging, with cramps; he had had some rum and small beer, and was vomiting the small beer at this time; the voice was husky; mind collected; eyes sunk; tongue coldish and furred; air from lungs cold; no pulse; skin cold.

R Tinct. Opii ʒj.
Brandy ʒj. statim s.

Was admitted into the hospital at half-past 10 A. M., when the skin was cold; pulse small and about 88; great thirst; severe cramps of legs; no vomiting or purging at present. External heat and frictions were actively employed.

Quarter before 11. — Had a bladder of oxygen gas; the pulse at the wrist rose to 136. Heart beat violently; pupils were dilated; feels a tightness

across the chest; gasped for breath, but said he did not feel very giddy; the pulse soon fell and became weak.

11 A. M. — Complains of pain in the epigastrium.

Ordered cataplas. sinapeos epigastrio; and to take a solution of carbonate of ammonia and nitric acid drink, alternately.

12 M. — Pulse imperceptible, both at the wrist and brachial artery; great thirst; eyes turned upwards; countenance anxious; eructations; not much cramp.

Hot air bath was applied; the heat was very great, and the patient complained much; it was continued for half an hour, but produced no increase of temperature of the body, which was deadly cold.

Half past 12. — Great restlessness.

Hab'. Calomel. grs. x. statim s.

Hot brandy and water; rice water.

3 P. M. — Talks incoherently; pulse perceptible, extremely quick and small; has vomited a basin full of fluid; has passed no urine; complains of pain at the epigastrium, and of great thirst; is constantly crying out for cold water.

Hab'. Calomel. grs. x. statim s.

Cataplas. Sinap. pedibus.

7 P. M. — Restless; some stupor; face more cadaverous; less livid; voice a complete whisper; breathing laborious; skin deadly cold on extremities; trunk warm; hands soddened; no pulse at the wrist, but beating strong at the femoral artery, 120; swallows with difficulty.

Injiciatur Enema Terebinthinæ.

The spine was ordered to be rubbed with a solution of cantharides and vinegar.

9-45. P.M. — Pulse in femoral artery strong, 120; respirations 30; eyes suffused; stupor; has had one dejection. Liq. vesicans has blistered the back extensively.

V. S. brachio, a few drops of blood were obtained.

10 P.M. — Constant jactitation.

27th. — He died at 2 o'clock this morning.

EXTERNAL APPEARANCES 6 HOURS AFTERWARDS.

Expression of countenance calm; face bluish; hands shrivelled; fingers contracted; nails blue; body marked in places with deep lividity; arms marked with deep lines; tops of feet purple; tendons tense; whole body rigid and firm.

CASE XIV.

Nov. 27th. — Paul Sydney, æt. 33, mason, Silver Street. Temperate habits, admitted at 10 P.M. Was taken ill last night at 8, with sickness, purging, and slight cramps; at 10 o'clock the cramps were violent, and he became quite cold; was seen by Mr. Embleton, who endeavoured to abstract blood from the arm, and gave him a bolus of calomel and opium, and a mixture of rhubarb and magnesia; and ordered him to have weak brandy and water, with warmth to surface; at 8. P.M., to-day, he had the following symptoms: — Pulse small, skin cold, and one fore-arm and hands quite blue; constant vomiting of a watery fluid; great thirst; no pain. V. S. $\frac{3}{4}$ x., of dark blood were obtained.

10 P.M. — (In hospital.) Pulse small, 112; skin warmer; constant thirst; purging of a gruel-like fluid; no vomiting; no cramps: ordered frictions with turpentine to spine and legs, and to take barley water with a little brandy; expresses himself much better.

Hab^r. Calomel. grs. x. statim s.

28th. 8 A.M. — Passed a quiet night; slept a little; has had three bilious dejections, and slight vomiting; thirst not so great; tongue moist; skin warm; pulse 110; has no pain; passed no urine.

R Ol. Ricini \bar{z} ss.

Sp. Æth. Nit. \bar{z} ij. statim s.

Beef tea and barley water.

2 P.M. — Skin hot; pulse 120; tongue slightly furred; not much thirst; no pain; still sick; has had one bilious dejection; no urine.

R Magnesia \bar{z} ij.

Aq. Menthæ \bar{z} vss.

Sp. Æth. Nit. \bar{z} vss. M. \bar{z} ss. omni horâ.

Thick beef tea.

Half-past 7 P.M. — Skin not so hot; pulse 120; vomiting continues; has had one dejection; no urine.

R Hyd. Subm. grs. v.

Opii gr. j.

Conf. Rosæ q. s. f. Bol. horâ somni sumendus.

29th. 9 A.M. — Passed the early part of the night in a restless state; skin not so hot; pulse 96; tongue moist; no thirst; passed some strongly offensive urine; has had six bilious dejections.

Beef tea.

10 P.M.—Sleeping; eyes half open; conjunctiva suffused.

Rep. Bol. ut heri.

30th. 8 A.M.—Slept well all night; still sleeping.

11 A.M.—Says he is quite well; passed plenty of urine.

Cont. Mist. Magnes.

Convalescent.

CASE XV.

Nov. 27th.—Henry Hopps, æt. 37, labourer, from No. 9. Mill Street, admitted at 4 P.M. States, that the landlady of the house placed him in the same bed in which Patrick Millan (a Cholera patient) slept on Saturday night, Nov. 19.; at present is purged; has some sickness with giddiness, and cramps of legs.

R Tinct. Opii \mathfrak{m} xl.

Sp. Æther. Nit. 3 ij.

Aq. Menth. \mathfrak{z} j. statim s.

To have gruel, with a small quantity of brandy; and coffee.

28th. 9 A.M.—Has been much purged in the night; pulse rather quick; skin damp; some thirst.

R Calomel. gr. vj.

Opii gr. j.

Conf. Ros. q. s. f. Bol. statim s.

Hab'. Mist. Magnes. \mathfrak{z} vj. \mathfrak{z} j. tertiâ horâ.

29th. 10 A.M.—Slept well towards this morning; had two dejections, and passed some urine.

Cont. Mist.

Beef tea.

30th. 9 A. M.—Slept well all night; bowels open; passes plenty of urine.

(Discharged.)

This case is given as an example of treatment of the premonitory stage.

CASE XVI.

Nov. 29th. — Susan Nanson, æt. 19, from Bains' Lane, was attending upon Mrs. Wardle (a Cholera patient) last night, and was taken ill at 2 A. M. with violent trembling and coldness, after which she had cramps of left foot, left side and arm; she then became sick and vomited, with a purging of watery matter; when visited at 10 A. M., she took two grains of opium, and was admitted into hospital.

12 M. — Pulse 96; tongue moist; much thirst; respiration hurried; some cramps of abdominal muscles, and vomiting.

V. S. ad $\frac{3}{4}$ x.

Hab^r. Bol. cum Calomel. gr. x. statim s.
Gruel and rice water.

3 P. M. — Cramp in left leg; in other respects better.

Hab^r. Pulv. Jalapæ C. ʒ ij. statim s.

30th. 8 A. M. — Rested pretty well all night; complains of pain and tenderness over the epigastrium; skin warm; pulse 80; tongue moist; bowels have been freely moved; urine copious.

Emp. Lyttæ epigastrio.

Diet. — Gruel.

Dec. 1st. 8 A. M. — Feels much better; rested well all night; blister rose well; pain in stomach

quite relieved; skin natural; tongue moist; no dejection; urine plentiful.

Rep. Pulv. Purgans, statim s.

2d, 9 A. M. — Says she is quite well; bowels have been freely moved.

(Discharged.)

CASE XVII.

Nov. 29th. — Margaret Rowntree, æt. 21, from Union Lane. Her mother died of Cholera, on the 24th, and she washed the blankets, &c. which had been used about her (it is not stated on what day she did so). She was attacked this morning at 2 o'clock, with cramps of the legs, succeeded by vomiting and purging; she had no assistance until half-past 6 A. M., when heat and frictions were applied to the surface, and some brandy administered.

She was seen at 6 P. M., and admitted into the hospital.

Pulse barely perceptible; tongue moist and warm; skin cold; eyes deeply sunk; makes no complaint; great stupor, and is apparently sinking.

Hab^r. Calomel. gr. x. statim s.

Warm air bath was applied, but produced but little effect.

Cataplasma Sinapeos pedibus.

Warm brandy and water.

10 P. M. — Much stupor, with jactitation; skin still cold; hands blue, arms mottled; slight vomiting; no purging; no urine.

R Ammoniæ Carb. ʒ ij.

Aq. Ment. ʒ viij. M. ʒss. omni semi-horâ.

From this time she became much worse, and died at half past 11 P. M.

CASE XVIII.

Nov. 30th.—Mary Freeman, æt. 20. Bains' Lane. Admitted into hospital at 11 A. M. States that on Saturday last, 26th, she was taken ill with vomiting and purging, cramps, but got well again without medicine. On the 28th, the symptoms returned: at present skin hot; pulse 118; tongue foul and moist; cramp at the pit of the stomach; blood was drawn to $\frac{3}{4}$ x., when she became faint; had

Calomel gr. vj.

Opii gr. j.

Weak brandy and water.

At 2 P. M. became restless; cold, vomiting and purging returned, with pain about the præcordia; heat to surface, and frictions with turpentine, were constantly applied.

Cataplasm. Sinapeos epigastrio.

Hot brandy and water.

9 P. M. — Complete collapse; no pulse perceptible at the wrist, or over the region of the heart. Two bladders of oxygen gas were immediately administered; during the administration of the gas, the countenance assumed a brighter appearance; the lips were florid; and she expressed herself better.

R Ammonia Carbon. grs. vj.

Sp. Æther. Nit. $\frac{3}{4}$ ss.

Aq. Menth. $\frac{3}{4}$ j. F. haust. statim s. et rep. omni horâ.

Dec. 1st. 1 A. M. — The hot air bath was used, but had no effect whatever.

Died at 4 A. M.

EXTERNAL APPEARANCES 4 HOURS AFTERWARDS.

Eyes open ; lips livid ; skin yellow all over the body ; fingers not contracted ; nails blue.

CASE XIX.

Dec. 8th. — John Murphy, æt. 45, admitted at 3 P. M.

Skin cold ; no pulse at the wrist ; great thirst ; voice husky ; slight vomiting of a dark brown grumous fluid ; much tenesmus ; no cramps at present.

Hab^r. Calomel grs. x. statim s.

R Ammoniæ Carb. ʒj.

Aq. Menth. ʒvj. M. Sumat. ʒj. 2dâ horâ.

To take hot brandy and water.

8 P. M. — Pulse small ; skin still cold, although constant heat and frictions have been applied ; vomiting and purging of a dark coloured fluid, not offensive ; less thirst.

Cont. Mist.

Hot brandy and water.

9th. 8 A. M. — Passed a restless night ; has had several dark brown bilious dejections ; skin cold ; pulse gone ; much stupor.

10 A. M. — Jactitation ; stupor ; appears at the point of death.

Died at 2 P. M.

This patient got out of bed whenever the tenesmus distressed him, in spite of all exertions to prevent his doing so.

CASE XX.

Dec. 2d. — Nurse Fairley, æt. 60 (chief nurse of the hospital), a stout, active, healthy woman, after undergoing severe fatigue, was attacked at 11 A. M. with vomiting and purging. She was put to bed, and took immediately the following pills :—

R Calomel grs. iij.

Opii gr. jss.

Capsici grs. vi. M. F. pil. ij.

When seen at 12 M., her countenance was sunk so as scarcely to be recognised ; voice husky, almost a whisper ; pulse scarcely perceptible ; severe spasms of the legs and thighs. V. S. ad $\frac{3}{4}$ xx. appeared to produce no effect ; the blood formed a semi-fluid mass as black as tar. A little serum exuded on the surface ; it was ascertained to contain free alkali, by the immersion of turmeric and litmus paper. A large enema of warm water and tinct. opii 3ij. was administered. Mustard poultices were applied to the stomach and legs ; calomel. grs. x. washed down with hot brandy and water ; constant frictions, with dry heat to the surface, were applied.

1 P. M. — Collapse more complete ; vomiting and purging less ; eyes sunk ; skin cold ; great and constant thirst ; pulse gone ; never rose after the bleeding.

Hab^r. Ol. Cajeput. ℥ xxiv. statim s.

2 P. M. — Cold sweat all over the surface ; the large enema was repeated.

Half-past 2 P. M. — Complains of severe pain about the præcordia ; pulse slightly perceptible, about 80.

Rep. Ol. Cajeput. \mathfrak{m} xxiv. statim s.

Hot brandy and water, rice water.

6 P. M. — Skin cold and clammy ; pulse very indistinct ; breath cold ; not much thirst ; no vomiting or purging.

Hab'. Mist. Ammon. Carb. \mathfrak{z} vj. Sumat. \mathfrak{z} j.
omni horâ.

8 P. M. — Jactitation ; skin cold and dry. Her death, which took place about a quarter of an hour after this, was preceded by strong convulsions, in one of which she expired. Intellect clear to the last.

CASE XXI.

14th Dec. — William Tate, æt. 60. This man was brought into the Cholera hospital at Sunderland, on the afternoon of Wednesday, the 14th Dec. (about 3 P. M.), having been given up for that purpose, as a desperate case, by the gentleman who had first been called to him.

From the accounts received at his residence (No. 15. Robinson's Lane), it appeared that he had been attacked about twelve hours before (3 A. M.), with vomiting and purging, and cramps in the legs and abdomen ; that these affections had continued, recurring at intervals with more or less violence up to the time of his admission ; and that he had received no medical aid of any kind.

At this time there was no pulse to be felt in any part of the body ; the prostration also was extreme, and the whole countenance was ghastly, and strongly indicative of suffering and distress ; but the skin and tongue, though cold, were not remark-

ably so, neither had the surface as yet assumed a livid hue. The patient, also, could still be roused when spoken to, and pressure upon the epigastrium showed he was still sensible to pain.

Under these circumstances it was determined to administer the mustard emetic; and after some difficulty two drachms, mixed with about eight ounces of warm water, were got down.

In about ten minutes after this, during which time the patient lay perfectly quiet, a copious discharge took place from the stomach, the fluid ejected being of course deeply tinged by the mustard, and containing, besides, a considerable quantity of white flaky matter.

When the action of vomiting had ceased, and the patient was replaced in bed, it was observed, with satisfaction, that the countenance had assumed a less ghastly appearance; that the colour of the lips was returning; and that the pulse was to be felt at the wrists and other parts of the body; — was even, soft, not feeble, and at 80.

Medicines of any kind might now have been given with ease; but they would have interfered with, or at least would have disguised, the effects produced by the mustard; and nothing therefore was exhibited but a little warm barley water, with a very small quantity of brandy in it, say, 1-5th part, or 4 oz. to a pint.

During the space of about fifteen minutes, no change took place in the state of the patient, when he was suddenly attacked with cramps in the soles of the feet and calves of the legs — and so violently, that he started out of bed, uttering piercing cries, and thrusting his feet towards the large stove near

which he lay, in the hope of obtaining some relief from the pain he was suffering. The spasms were relieved by tight ligatures (handkerchiefs) round the affected muscles.

When the violence of this paroxysm (for it was truly such) had in some measure subsided, the patient was replaced in bed ; and though still suffering severely from pain, and evincing, by his cries and his actions, a strong degree of vitality, it was observed with surprise that the action of the heart had apparently ceased, and that no pulse was to be detected at the wrists, or any other part of the body.

Whether this cessation of the heart's action had preceded, or accompanied, or followed the attack of spasm, it is now impossible to say : for that attack was too sudden and too violent to admit of any examination being made until it was too late to determine the question in this instance.

Nor has any opportunity since occurred of prosecuting the enquiry in a satisfactory manner, or of ascertaining whether a paroxysm of vomiting or purging without cramp is ever preceded, or accompanied, or immediately followed, by a similar event. Nor will the true connection between these various phenomena (cramps, vomiting, purging, and suspended pulsation,) ever be detected until opportunities for quietly watching the natural progress of the disease through all its stages present themselves, and to men also who will have forbearance enough to take advantage of the same.

As the cramps ceased the patient gradually became quiet, and again assumed the ghastly appearance he had presented on admission : it was

determined, therefore, to repeat the mustard emetic; and this measure, on being carried into effect in the manner already detailed, was again followed by similar events, namely, copious vomiting, and immediately after that restoration of the pulse and of the natural colour to the lips. At this time he passed a liquid stool containing feculent matter. From this time (about 4 P. M.) until the evening it was not deemed necessary to do more than maintain a due degree of warmth about the patient, and administer to him, in small quantities, and at regular intervals, some warm drink (barley water with brandy one fifth).

At 8 P. M. the temperature of the skin was natural, and the pulse about 90, soft, and distinct. As a slight attack of cramp in the legs had, however, been experienced some time before, it was deemed prudent to exhibit an opiate (*Tinct. Opii* \mathfrak{m} 40.), to which ten grains of calomel were added to guard against constipation, &c.

On the following day (15th Dec.) the pulse was at 80, and still soft and distinct; the temperature natural; and the countenance much improved, but there was some confusion of thought; the epigastrium was still tender on pressure; and the tongue at the edges was dry, and rough in the centre.

In fact, fever was setting in; and though during this and the following day very little change took place in the state of the patient, yet, on the 17th, it became manifest that his situation was very precarious; for the head was manifestly more affected than before; and the secretion of urine, which had never been freely restored, was now almost

entirely suspended. Towards the evening of this day also some delirium was observed, which terminated on the following morning in coma; and that towards the same evening in death.

Whether that event might have been retarded or prevented by any mode of treatment different from that adopted towards the patient during the febrile stage, is a question it must be always difficult to answer.

But candour obliges those who had the management of the case to acknowledge that their own conviction *now* is, that blood ought to have been abstracted on the evening of the 14th or morning of the 15th inst., when reaction was completely established. The progress of the disease would then, in all probability, have been rendered more manageable; and the tendency to coma, which marked its termination, have thus, perhaps, been more effectually obviated.

CASE XXII.

Dec. 16th. — Anne Stoddart, æt. 32., widow, 2. Silver Street; admitted into the hospital at half-past 8 P.M.; was first seen by Mr. Embleton about 7 P.M., at which time she was rolling about in the bed with violent cramps; had also vomiting and purging: he immediately gave her a mustard emetic, *which* produced full vomiting.

Half-past 8 P.M. — Skin cold; pulse imperceptible at the wrist, in brachial artery 100; tongue white and cold; temperature of mouth 84, hand 79; she had immediately, in the presence of Dr. Lindsay, another mustard emetic, which was

repeated twice, without producing the slightest benefit, although full vomiting was produced.

10. P.M. — Cramps ceased; much jactitation; temperature 82 in the mouth. — Brandy and hot water, and the nitrous oxide gas, were administered without effect; pulse was not affected by the nitrous oxide.

12 P.M. — The carbonate of ammonia mixture and brandy continued.

1 A.M. — Just the same; to continue the medicines.

17th. 9 A.M. — Has remained in the same state all night; skin cold and blue; voice weak; eyes sunk; no pulse; not much thirst; breathing laborious.

Died a quarter before 12 this day.

CASE XXIII.

Dec. 18th. — Mrs. Peacock, æt. 41., a stout strong woman, and a nurse, residing in the Low Street, Sunderland. Has had diarrhoea for three days, without preventing her going about her usual avocations; was seized this morning at 3 o'clock, with vomiting, severe purging, and cramps of abdominal muscles and limbs. Was not seen until 9 A.M., at which time she was still vomiting and purging a watery fluid containing large flocculi; it was squirted with great force from the bowels: skin moist, and moderately warm; pulse small and quick; voice husky; great thirst. Dry heat was immediately applied over the surface, together with frictions; weak brandy and water and rice water were ordered to be drank; and the following pills to be taken immediately:—

R Calomel gr. x.

Acet. Morphiae gr. j.

With a mixture of magnesia, mint water, and spirit of nitrous ether, to take \bar{z} j. every half-hour.

At 11 A.M., became much worse; cramps were dreadfully severe; pulse fluttering; eyes sunk, and surrounded by a dark rim; thirst excessive; skin damp and coldish: blood to the amount of \bar{z} xij. was taken from the arm; it flowed freely, but during the operation the pulse left the wrist, and the face became more sunk and pale; the blood drawn was rather dark. The mustard emetic was now given, and produced full vomiting, with little or no restoration of pulse. A mustard cataplasm was applied to the epigastrium; friction with hot flannels along the spine and extremities: the cramps were less severe after the bleeding; but the evacuations were squirted with great force from the anus. 1 P.M. — Breathing now oppressed; seems anxious; intellect clear; cramps returned for the first time since the bleeding, but not so severe. Half-past 1 P.M. — Vomiting and purging ceased. Sumat statim,

Calomel, gr. x.

Opii gr. j.

Capsici gr. ij.

} Ft. Pil. ij.

These pills were to be repeated in an hour.

3 P.M. — Moans constantly; restless; violent retching; pulse 112, scarcely countable, irregular and intermitting; skin damp; temperature in the hand 78 F., mouth 90; tongue dry and brown. The pills had not been taken: to have instead the magnesia mixture, and shortly afterwards 10 grs. of calomel, and to continue the weak brandy and

water. Soon after our visit she removed the cataplasm, as it annoyed her; after which she remained quiet until half-past 4 P. M., when she became extremely restless; the cramps of abdomen were dreadful: said she would get up, and, whilst in the act of rising, fell back, and instantly expired.

CASE XXIV.

Dec. 13th. — Miss E. S., æt. 12., resided in the same house with her grandmother, who had the disease a week before, and was in constant communication with her. She was attacked with diarrhoea on the 10th. She was ordered to take the usual remedies; but, from false indulgence, they were not administered.

At 9 P. M. on the 13th, she was seized suddenly with complete collapse; skin cold; face pale; eyes sunk; tongue and breath cold; pulse scarcely perceptible; respiration laborious; much jactitation and thirst: some stupor came on at about 10 o'clock. Hot brandy and water was immediately administered; dry heat applied over the body, and mustard cataplasms to the epigastrium and soles of the feet.

Half-past 11 P. M. — Complete stupor; skin not so cold as usual; pulse more perceptible, about 144: a vein was opened, and about $\frac{3}{4}$ j. of dark blood trickled from the orifice; the pulse became more distinct. The hair was removed from the head, and cold applications applied; we now endeavoured to administer the nitrous oxide gas, but could not succeed as we wished, owing to continual restlessness.

Half-past 12 A. M. — Used the warm bath of

110 F.; but she only remained in it 10 minutes, as she could not bear it: pulse whilst in the bath 140.

A large blister was applied along the spine, and 5 grains of calomel were given.

Shortly afterwards she sunk into a state of coma, and expired at 5 P.M.

CASE XXV.

Dec. 5th. — Elizabeth Snipes, æt. 20., under-nurse in the Cholera Hospital, was attacked with diarrhoea, attended with severe pain in the abdomen; skin rather hot; pulse quick; tongue rather furred; some thirst.

R Hyd. Submur. gr. vj.

Pulv. Opii gr. j. F. Pil. statim sumend.
Sago and gruel.

Hab^r. Mist. Magnes. ʒ vj. Sumat ʒ j. tertiâ horâ.

6th. — Much better.

Rep. Pil. & Mist.

7th. — Convalescent.

On the 9th she ate largely of boiled beef; made no complaint, except of loss of appetite and weariness, till 3 P.M. on the 10th, when she was attacked with a sudden acute pain at the epigastrium, and in the small of the back, about the last dorsal vertebræ: she had some ineffectual retchings. Pulse small, thready, and quick; limbs cold and affected with cramps; great anxiety; severe pain about the præcordia: about an ounce of

kitchen salt, in a pint of warm water, produced some vomiting, but trifling. It was repeated; and as it did not produce much effect, we administered pulv. ipecac. grs. xxv.; full vomiting was produced: she ejected a quantity of watery fluid; and several large pieces of meat, which had been swallowed unchewed the day before, were returned unaltered: cramps still continued, and acute pain in the epigastrium; pulse stronger. V. Sect. ad $\frac{3}{4}$ xvj.: blood dark, but coagulated, and left a sufficient quantity of serum; some buffy coat was intermingled on the surface of the coagulum.

R Hyd. Submur. gr. viij.
Pulv. Jalapæ gr. x. M. Statim sumend.
Cataplas. Sinapeos Epigastrio.

8 P. M. — Skin warm; pulse 100; great thirst; pain in the back part of the head; no vomiting; no dejection.

Rep. Pulv. j. Gruel and rice water.

12 P. M. — Feels easier; pulse 100; has had one small dejection; passed a small quantity of urine. Quiescat.

11th. 9 A. M. — Slept occasionally; has less pain; skin warm; pulse 86, full; tongue rather dry; some thirst; no dejection; no urine.

Hab^r. Pulv. Jalapæ Comp. $\frac{3}{4}$ j. statim sumend.

Half-past 3 P. M. — Feels easier; has had two dark dejections; no urine.

R Mist. Magnes. cum, Sp. Æther. Nit.:
sumat $\frac{3}{4}$ j. tertiâ quâque horâ.

12th. 10 A. M. — Slept badly all night ; has had a great deal of pain in the head, back, and stomach. The stomach and back are easier, but the head is still painful ; thirsty ; pulse 100 ; no dejection ; passed some urine during the night.

Rep. Pulv. Jalapæ Comp. statim sumend.

6 P. M. — Pain in the head continues ; pulse 104 ; tongue rather dry ; not much thirst ; no dejection.

Hab'. Ol. Ricini $\frac{3}{4}$ ss. omni horâ donec alv. sol. sit.

13th. 10 A. M. — Passed a restless night ; complains of pain in the head ; skin hot ; pulse 104 ; tongue moist ; not much thirst ; feels pain at the epigastrium, and sickness ; has had five copious dejections.

Emp. Lyttæ Epigastrio.

R Mist. Febrif. $\frac{3}{4}$ vj. : sumat $\frac{3}{4}$ j. tertiâ quâque horâ.

8 P. M. — Feels easier ; pain in the head relieved ; tongue moist ; pulse 90 ; skin natural ; has had some dejections ; urine copious.

Sago, &c.

14th. 10 A. M. — Slept well all night ; has no pain ; pulse regular ; skin natural ; tongue clean ; bowels open ; urine natural.

Sago and broth.

15th. 10 A. M. — Slept well ; has some pain in the back of the head ; catamenia fluunt ; has had two dejections.

Convalescent.

CASE XXVI.

Nov. 19th, 1831. — Mrs. Haswell, æt. 55., a Dispensary patient, residing in the upper part of Bishop Wearmouth: has had no intercourse with persons affected with the disease, but has connexions residing in Silver Street, with whom she has had intercourse.

She was attacked, at 3 A. M., with vomiting; but did not send for advice till 8 o'clock, when she was found cold and pulseless, with severe cramps and vomiting, and purging profusely a fluid of the usual characters; great thirst.

R Sp. Ammonia Aromat. 3 iij.

Sp. Ment. Pip. 3 ij.

Aquæ 3 vss. M. Sumat coch. ij. omni horâ.

Hab^r. Confectionis Opiatæ 3 ss. omni horâ.

To have brandy and barley water acidulated with nitric acid for common drink.

Heat to be applied by numerous bags of hot sand and bran, hot bottles, &c. Frictions.

Cataplasmata Sinapeos Epigastrio et Suris.

10 A. M. — A slight thread of pulse perceptible at the wrist, and some warmth in the extremities, — probably owing merely to the assiduous application of heat and friction; for the face and chest were deadly cold, and the breathing oppressed. Vomiting and purging had ceased: a vein was opened, and about two ounces of black blood were obtained; it formed a thin grumous-looking jelly, and did not give out any serum.

4 P. M. — The shrinking of the cellular substance is most remarkable: the woman looks as if she was 70 instead of 55 years old; her voice is scarcely audible: the case appears hopeless. Ordered to continue the brandy and barley water with nitric acid.

19th. Vespère. — Feels easier; pulse imperceptible; breathing oppressed; thirst continues; great flatness of abdomen; some retching.

R Calomel gr. viij.
Pulv. Opii gr. ij. stat. sumend.

20th. 10 A. M. — Collapse continues, with slight cramps, blueness of nails and of the left hand; pulse barely perceptible; no dejection; urine continues suppressed.

R Decoct. Aloes Comp. 3 vj. stat. sumend.
R Ol. Terebinth.,
— Olivæ, āā 3 jss.

To be injected, and followed by a quart or more of barley water.

R Ammoniac Carb. 3 ij.
Tinct. Card. Comp. 3 ss.
Sp. Æther. Nit. 3 iij.
Aquæ Menth. 3 v. M. Sumat 3 ss.
tertiâ quâque horâ.

10 P. M. — Injection returned unchanged. Symptoms continue as before, with some stupor.

R Ammon. Carb. 3 ij.
Sp. Æther. Nit. 3 ss.
Tinct. Card. Comp. 3 ss.
Aquæ Menth. 3 vj. M. Sumat 3 ss.
omni horâ.

Hab'. Calomel. gr. vj. stat. sumend.

21st. — Rep. Decoct. Aloes.

Injectio.

Died at 5 P. M.

CASE XXVII.

Mrs. Cummings sat up with Mrs. Haswell, and was attacked with sudden giddiness and faintness, succeeded by pain at the epigastrium, on the evening of the 21st. The following morning she was attacked with purging and slight sickness, with cramps of one leg.

22d. — Pulse quick and weak ; skin rather cold.

R Calomel. gr. iij.

Pulv. Ipecac.,

Opii, āā gr. j.

Conf. rosæ q. s. ut ft. Bolus stat.
sumend.

R Sp. Æther. Nit.,

Vin. Ipecac., āā ʒ ss.

Liq. Ammon. Acetat. ʒ ij.

Aquæ Puræ ʒ iv. M. Sumat ʒ j. 4tâ
quâque horâ.

Ordered to be kept warm in bed, and to take gruel with ginger in it.

23d. — Slept well, and feels much relieved, but complains of a loaded, distended feeling of abdomen ; pulse quick ; tongue furred.

R Ol. Ricini,

Tinct. Rhæi, āā ʒ ss. stat. sumend.

4 P. M. — Has passed a quantity of very offensive dejection ; urine sparingly secreted.

Rep. Bolus, h. s. sumend.

R Decoct. Aloes Comp. \bar{z} ij. Sumat \bar{z} j.
statim, et manè repetatur.

24. — Convalescent.

N.B. The daughter of Mrs. Haswell, who lived near her, and attended her, was attacked with similar symptoms; and recovered under a dose or two of calomel, with decoct. aloes: but the treatment was not noted at the time.

CASE XXVIII.

Mary Hutchinson, æt. 39., was admitted into the Fever-house, on the 9th Dec. 1831. She has had diarrhœa since the 7th, for which she was ordered powders of rhubarb, ginger, and magnesia, which she took with relief: last night she took some warm ale; she slept till 4 A.M., when she was attacked with violent purging of a yellowish liquid, and with cramps: at 7 A.M. she passed urine.

9 Dec. 8 A.M. — Skin cold; pulse very small; vomits and purges a gruel-like fluid.

R Pulv. Capsici gr. ij.

— Opii gr. j.

Calomel. gr. j.

Conf. Rosæ q. s. ut ft. Bolus, stat. sumend.

11 A.M. — Has been brought into the Fever-house.

Pulse, scarcely perceptible, 90; skin cold and damp; countenance anxious, shrunk, and pale; eyes

sunk; vomiting and purging have ceased; much thirst, and pain of epigastrium; tongue moist and cold; nails blue: ordered brandy \bar{z} j. with hot water immediately: bags of hot bran to be applied all round the body.

R Ammon. Carb. \varnothing j.
Tinct. Card. \bar{z} iij.
Sp. Lavend. Comp. \bar{z} ss.
Aquaë Menth. \bar{z} j. M. Fiat Haust. statim sumend.

Half-past 11 A.M. — Felt better after the draught; pulse stronger, 120; respiration laborious and moaning; slight vomiting: to continue the brandy and water with a little nitric acid.

Cataplasma Sinapeos Epigastrio.

Half-past 2 P.M. — Has vomited occasionally; pulse 120; less blueness under the eyes; dislikes the acid: to continue the brandy and water weak without the acid.

Repetatur Haust. Ammon. Carb. ut suprâ quartâ quâque horâ.

10 P.M. — Pulse 96, stronger; countenance full; skin warm.

R Sodæ Carb. \bar{z} ij.
Aquaë \bar{z} vj. M. Sumat \bar{z} j. cum Succo
Limonis \bar{z} ss., tertiâ quâque horâ.

10. Much improved; was ordered sago with sherry. Took calomel and aperients.

11. — No dejection nor urine till this day; con-

tinued to improve; and was dismissed cured on the 18th.

CASE XXIX.

Joseph Pescot, æt. about 40.

Half-past 11 A.M. — Has had pain and uneasiness of bowels during the night: at this time he complains of continued nausea, with frequent characteristic vomiting; much jactitation; extremities cold; pulse slow and indistinct; countenance collapsed; voice broken.

R Pulv. Ipecac. ʒ ss.
Ammon. Carb. ʒ j.
Aquæ Menth. ʒ j. M. Fiat Haust.
Emet. stat. sumend.

R Ammon. Carb. ʒ jss.
Tinct. Opii ʒ ss.
Aquæ Puræ ʒ vj. M. Sumat ʒ j. cum
Succi Limonis ʒ ss. tertiâ q. h.

Heat to be applied to the extremities and to the region of the stomach.

19. — Vomiting ceased after the emetic had operated; all the symptoms are relieved; no dejection.

R Pulv. Rhæi ʒ j.
Magnesiæ ʒ ij.
Tinct. Zingib. ʒ ss.
Aquæ Menthæ ʒ vss. M. Sumat ʒ j.
tertiâ quâque horâ.

Vesperè sumat Hydr. Submur. gr. iij.

Pulv. Rhæi gr. xvij. in formâ Boli.

20. — No dejection ; some stupor.

Admoventur Nuchæ Emp. Lyttæ.

Rep. Bol. statim, et sumat Ol. Ricini $\frac{3}{4}$ ss.
post horas ij.

21. — Bowels freely relieved ; blister rose well.
Convalescent.

CASE XXX.

For the following case we are indebted to Mr. Grecian, Surgeon.

Dec. 6. 1831. — Susan Clarke, æt. 18. at 6 P.M. was attacked with vomiting and purging ; her previous health having been good : when visited at 7 o'clock, her pulse was 75, rather strong ; skin cold, but natural ; tongue clean : complained of pain in the head, and slight pain over the region of the stomach ; was bled, but only 5 or 6 ounces of thick black blood, resembling tar, could be obtained : ordered the following : —

R Liq. Ammon. Fort. $\frac{3}{4}$ j.

Tinct. Opii $\frac{3}{4}$ ij.

— Capsici $\frac{3}{4}$ j.

Sp. Lavend. Comp. $\frac{3}{4}$ iss.

Mist. Camphor. $\frac{3}{4}$ xjss. M. Sumat $\frac{3}{4}$ j.
omni horâ.

Ordered a little brandy with hot water to be taken occasionally, and warmth to be applied to the extremities.

9 P.M. — No better after the bleeding ; pain in the head increased ; the vomiting ceased after the second dose of the mixture ; reaction took place.

Dec. 7th. 10 A. M. — Pulse 80 ; skin warm ; tongue dry ; no vomiting since last night : ordered the mixture and brandy to be discontinued and a pill of ext. colocynth. co. et pil. hydr. to be taken every three hours.

8. 9 A.M. — Found her vomiting and purging a fluid resembling rice water ; skin cold ; no pulse at the wrist ; voice altered ; had passed no urine for the last 8 hours ; left hand had a bluish tint ; severe cramp and pain over the region of the stomach, which continued for an hour ; great prostration of strength ; eyes sunk ; features contracted : ordered brandy and water, and the mixture as prescribed on the 6th to be repeated ; frictions to be constantly used.

12 A.M. — Symptoms more aggravated.

2 P.M. — The vomiting and purging ceased ; she gradually became weaker, and died at 9 P.M.

Post-mortem examination of Susan Clark : —

External Appearances. — The person full and robust ; eyes somewhat collapsed ; corneæ not opake ; a dark areola surrounded the eyes ; cheeks plump, and not collapsed ; expression placid ; lips livid.

Thorax. — On laying open the thoracic and abdominal cavities no morbid appearances presented themselves in the cavity of the chest ; pericardium natural, containing the usual quantity of fluid ; heart small and healthy ; left ventricle small and firm ; aorta empty ; right ventricle of proportionate size, and was filled with dark, viscid, fluid blood, entangled in the columnæ carneæ.

Pulmonary artery healthy in structure, and full of the same dark viscid blood. Blood of a similar

description loaded all the large veins of the lower part of the neck, and superior part of the thorax.

Lungs perfectly natural, and without engorgement; the right lung had contracted; firm adhesions to the parietes of the chest.

Abdomen.—There appeared a total want of serous exhalation in this cavity; the serous covering of the small intestines, and the lining of the abdominal muscles, were perfectly dry, and felt gritty to the touch. The intestines seemed slightly injected with blood; the stomach appeared inflated with air; on cutting into it, the mucous surface was found covered with a dotted redness in various patches; its texture was soft, and covered with a viscid glairy fluid, which yielded to the nail carried along the surface of the stomach.

Near the pylorus there were several well-marked elevated rugæ radiating from a central point, and, after a short course, losing themselves on the surface.

Small intestines being laid open for a considerable distance from the ileo cæcal valve contained a quantity of the same viscid fluid, with suspended flocculi adhering to the inner surface of the intestine.

The mucous coat beneath exhibited no marks of inflammation. The duodenum contained the same fluid but less viscid; it contained no bile. The ileo cæcal valve was healthy and perfect.

The large intestines were healthy and contained the same fluid matter, but not so viscid as in the ileum; at the lower part of which it seemed as if it had been laid on with a brush.

The liver, spleen, kidneys, pancreas, uterus, and

ovaria, were perfectly natural and healthy; the gall bladder was full of bile.

The urinary bladder contained no urine, and was small, flattened, and laid up against the ossa pubis so as to scarcely be perceptible.

It had the appearance of having been thrust up into that position at the moment of contraction.

For the three following cases we are indebted to Dr. Ogden.

CASE XXXI.

Nov. 8th, 7 P.M. — E. C., a woman, æt. 39. Suddenly attacked with violent pain at epigastrium, and sense of great constriction of thorax, weakness of legs and severe pain in the gastrocnemii; was obliged to be carried home. Seen in about 15 minutes afterwards.

Has had diarrhœa for two days, which to-day has been copious. Pulse weak; frequent; extremities cold; respiration oppressed; nausea.

Bled to $\frac{3}{4}$ xvi. with great relief to the pain of epigastrium and of legs; pulse improving in fulness as the blood flowed.

Sumat. Pulv. Opii. grs. ij. statim.

A glass of brandy and warm water.

In half an hour the pain at epigastrium and constriction of thorax had returned; pulse was again weak; eyes sunk; a livid circle round the lips; great prostration of strength; pain of back, part of thighs and legs.

Bled again to $\frac{3}{4}$ xvij. with much relief.

A cloth dipped in boiling water applied to the epigastrium.

Sumat. st. Hyd. Submur. gr. x.

In formâ boli cum Olii Menthæ gr. iij.

10 P.M. — Continues easier; eyes sunk, and surrounded by a livid circle; pulse soft; skin moist; tongue moist and whitish; some pain of legs.

Quiescat.

Nov. 9th, 8 A.M. — Has passed a quiet night, and had a few hours sleep: vomited about 1 A.M.

During the day, the vomiting and purging recurred at intervals, but yielded to the use of brandy and water, and she afterwards rapidly recovered.

CASE XXXII.

Nov. 22d, 1831. — W. B. æt. 54. Strong and generally healthy; of intemperate habits; sickness, and general uneasiness; in the afternoon diarrhoea and slight vomiting, which was relieved by laudanum gut. xxx., in brandy and water. — At 7 P.M. anxiety of countenance; spasms of hands and feet; cold clammy sweat all over; some dyspnoea; pulse rapidly failing; hands and feet cooling.

Bled with difficulty; $\bar{3}$ xvj, of blood obtained; pulse improved; cramps of hands, feet, and legs became more intense. Half past 7 P.M., hands and face very livid; the former cold.

Sumat.

Ol. Terebinth. $\bar{3}$ vj.

Sp. Æth. Nit. $\bar{3}$ ij.

Spasms abated about three quarters of an hour after their commencement; much jactitation, but

declares himself free from pain. He complained of some pain in the iliac regions, in the commencement of the disease.

Heat applied to the feet. Brandy given internally.

About half past 8 P.M. a bladder of oxygen gas, affording 8 or 9 inspirations, was given, on which the pulse seemed to improve.

Sinapism to the thorax and epigastrium, another to the abdomen.

Injection, Enema ex.

Olii Terebinth. ʒj.

Infusi Sennæ ʒv.

Sumat. Hyd. Submur.

Pulv. Rhei ā ā gr. viij.

Formâ boli cum olii cassiæ gut. v.

Returned the injection soon; vomited all the ingesta; jactitation continues; no secretion of urine; hands dark, livid, and shrivelled.

Another bladder of oxygen was administered, producing decided improvement in the pulse, and slightly dissipating the lividity of the lips.

23d. Soon after 1 A.M. had the characteristic vomiting and purging; another bladder of oxygen given.

Ol. terebinth. ʒij, twice given by mouth; nitric acid drink (ʒj. strong acid to ℥j. barley water) given him; voice and intellect continued unimpaired to his death, which took place between 5 and 6 A.M.

CASE XXXIII.

Dec. 20th. — J. Carr, æt. 48, keelman. Attacked at 1 P. M. with copious purging and some vomiting; and at 3 with spasms. At 4 P. M. pulse tolerable; hands cold and blue; bled to $\frac{3}{4}$ x; blood flowed in a jet at first, but soon fell to drops — one half of the stream was black, the other redder.

4½ P. M. — Profuse cold sweat; pulse imperceptible. A mustard emetic given, which excited full vomiting without any improvement of the pulse.

The vomiting having ceased, the following draught was given: —

Æth. Sulph. ʒj.

Tinct. Opii ʒ ss.

Aquæ $\frac{3}{4}$ ss.

About this time was purged to the extent of about a quart of aqueous matter, characteristic of malignant cholera. Painful spasms of thighs.

6 P. M. — Some more purging; a little vomiting; pulse imperceptible; hands cold and blue; voice a whisper; skin shrivelled; fingers contracted; feet warm; eyes sunk.

To have some brandy and water, and constant friction to limbs. A sinapism to epigastrium, and one to each thigh.

R Hydr. Sub-mur. ʒj.

Olei Ment. Pip. gut. vi.

Conf. rosæ q. s. ut ft. bolus st. sumend.

9 P. M. — No more vomiting or purging, nor any spasm; sinking rapidly; feet warm, hands cold.

Mustard emetic repeated, but failed to operate.

11 P. M. — Delirium; much jactitation; whines piteously; no urine since the commencement; tongue and breath cold; feet still warm.

Sumat. Hydr. Sub-mur. grs. x.

Brandy occasionally.

Died at midnight.

Two of his children died of the disease — one on the 11th, the other on the 14th; his wife had an attack and recovered.

He had diarrhoea three days, and during the night preceding his death he was working on the river. He came home at noon, and was ill at 1 P. M. He was a stout, strong and healthy man, but had been subjected to great privations in diet from want of sufficient employment.

EXAMINATION TEN HOURS AFTER DEATH.

Muscles in a state of great rigidity; their margins strongly marked; much sugillation; extremities livid.

Head, dura mater reddish; arachnoid milky; medullary substance of the brain when cut displayed venous orifices, whence dark blood issued by drops; cineritious substance natural; sinuses full of blood.

Spinal Marrow perfectly natural; its veins somewhat distended. All the cavities of the heart filled with uncoagulated black blood; coronary veins distended.

Lungs gorged with black blood, crepitating on pressure; air vessels contained frothy mucus; liver natural; gall-bladder distended — its ducts obstructed.

Stomach externally natural; its mucous membrane dotted red, perhaps owing to a quantity of mustard which remained in it. Small intestines showed a little vascularity towards the pylorus; large intestines lined with a whitish pultaceous matter.

Urinary bladder contracted to the smallest bulk; vena porta and meseraic veins empty; vena cava full.

CASE XXXIV.

For the following Case we are indebted to Dr. Brown.

Dec. 6th. — Reverend Mr. S., æt. 40. Had suffered under diarrhœa the preceding day, and on the night of that day felt great uneasiness of the stomach, with some retching, a small quantity of colourless fluid being discharged; the bowels were at the same time disturbed, and he had three evacuations within a short period, described as being slightly yellow; about the same time it was stated there was an involuntary discharge of urine.

Visited at 1 A. M. by the assistant of his surgeon, Mr. Ward, who gave him a calomel bolus and a mixture of magnesia, &c.

Mr. Ward saw him at 4 A. M., and gave him two successive doses of ipecacuanha, which produced full vomiting, the fluid vomited being colourless; bled him to eight ounces, and administered an enema, containing oleum terebinthinæ.

Visited by Dr. B. at 11 A. M., who found him with trismus so complete, that an aperture of considerably less than an inch was all that could be obtained between the teeth. His intellect was clear; his speech hurried and interrupted by spasms of the muscles of the throat; and there was utter inability to swallow, apparently from the same cause. There was a rigidity almost tetanic about the whole body; there were cramps of the limbs, which he requested might be occasionally rubbed, but they appeared to be much less severe than those about the throat; countenance rather flushed, and manifestly anxious; pulse 104, full and strong; skin warm, and covered with a profuse perspiration; and nausea, with some pain of the epigastrium, but without vomiting. The bowels had not acted for some hours. The blood drawn by Mr. Ward was rather sizy.

Bled to twenty ounces; an enema of gruel and salt, with some oleum-terebinthinæ, was administered, and a sinapism was applied along the whole length of the spine.

The power of swallowing was restored apparently by the bleeding, and when a small quantity of liquid was given, his manner of taking it reminded his medical attendant of the hurried mode in which a patient in hydrophobia gulps down water, after having by a strong mental effort brought himself to make the attempt in spite of his repugnance to the fluid. In this case, we need scarcely remark, there was no dread of water. The blood drawn was sizy, and a discharge was obtained from his bowels perfectly colourless, inodorous, and containing mucous and flaky matter.

2 P. M.—He retains the power of swallowing. Spasms about the throat continue, and there are convulsive twitchings of the muscles of the face; no urine passed, nor any further discharge from the bowels. He complains of nausea, and of great uneasiness of the stomach; appears weaker; pulse less forcible and skin less warm.

Emp. Cantharidis Epigastrio.

Sumat statim Hydrar. Subm. grs. x. c. haustu sequente.

R Tinct. Opii ʒj. Aquæ Menthæ ʒiij. M.

To take at intervals a teaspoonful of wine and water; he cannot swallow more at once. Subsequently to this, there was some, but not considerable, abatement of the spasms. Actual sinking took place at 9 P. M. and he died at half past 11.

Appearances on Dissection.

Nothing remarkable externally but blueness of the nails; no coddled or shrunk appearance of the hands; the subject plump.

Thorax.—Right lung healthy and crepitating, excepting in the posterior part, where it was rather gorged.

Left Lung in the same state, only that the engorgement there was more considerable than in the right.

Gullet, Larynx, and Trachea, healthy.

Heart rather soft, and perhaps somewhat more developed than natural—in other respects healthy; the right cavities full of blood, but not distended; pleuræ healthy.

Abdomen. — Vena portæ empty ; vena cava full of blood.

Liver more than usually gorged ; gall-bladder full of dark bile—itself healthy.

Stomach healthy, excepting a very slight degree indeed of redness in one or two points of the mucous membrane ; intestines healthy, void of contents.

Urinary Bladder distended with urine ; venous congestion of the kidneys.

Head.—Some degree of venous congestion of the brain, and a small quantity of serum in the ventricles ; cerebellum and medulla oblongata congested ; spinal marrow healthy.

CASE XXXV.

For the following cases, in which oxygen and carbonate of soda were administered with strikingly good effect, we are indebted to Mr. Torbock.

Nov. 17th. — Sarah Tatten, widow, æt. 53, Buck Square, Warren Street, had attended a neighbour ill of Cholera.

9 P. M. — Three hours after the attack she was in a state of complete collapse ; no pulse perceptible at the wrist, or over the region of the heart ; vomiting and purging the characteristic fluids ; countenance shrunk ; eyes deeply sunk, and surrounded with a dark areola ; lips livid ; tongue and mouth, even to the pharynx, moist and cold ; fingers contracted ; nails lead-coloured ; constant cramps of extremities ; urine suppressed, as ascertained by the introduction of the catheter.

A vein was opened, and four ounces of highly carbonised tar-like blood were procured.

Ordered, Sp. *Æther Nitrici* ζ iij. s. sumend. and to drink hollands' gin and water, at intervals.

12 P. M. — No improvement; administered two bladders of oxygen gas: during its inhalation the pulse became perceptible; the lividity of the countenance was diminished; and she stated that she felt much relieved.

18th. 2 A. M. — Slight increase of temperature about the chest; vomiting and purging diminished; tongue warmer; pulse 100, scarcely perceptible; had passed a little straw-coloured urine; complains that the vomiting produces dreadful exhaustion.

R Tinct. Kino. ζ j.

Sp. *Æther Nitrici* ζ iij.

Mist. Sumat. ζ ss. omni semi horâ.

8 A. M. — Great collapse, says she is dying; she inhaled two bladders of the gas, with relief, and the return of pulse; vomiting, purging, and cramps have ceased.

10 A. M. — Feels better; repeated the inhalation; complains of oppression of the chest; has passed much urine: ordered the mixture, before prescribed, to be continued, with the addition of mist. cretæ. To take linseed tea, boiled milk and sago, with a little weak gin and water.

19th. 9 A. M. — Much improved; pulse 90, full and less frequent; has passed two chalky-coloured stools; voided urine; complains of pain in the chest with cough: from this time she continued in a feverish state to the 24th, when she was discharged cured.

CASE XXXVI.

Nov. 19th, vespere. — Emily Hopper, æt. 35, widow, Mill Street. Had been attacked this morning with slight giddiness of the head, pain of epigastrium, with cramps of extremities, and slight vomiting; had been bled to $\frac{3}{4}$ xvj., and had taken brandy and laudanum.

When visited I found her with symptoms as formidable as those of the former cases; cramps of great violence affecting the legs and arms, toes and fingers. She inhaled two bladders of oxygen gas with great relief. The cramps abated; complaints of slight pain in the head.

Administered an enema of starch with mustard, and ol. terebinth. $\frac{3}{4}$ ij.

Complete re-action was established, and she was discharged cured on the 25th.

CASE XXXVII.

Nov. 20th. — Thos. Knell, æt. 25, pilot, son-in-law of Tatten, whose house he frequented, was attacked with the characteristic symptoms of great violence. Cramps of the recti and gastrocnemii of great violence. He had been bled to $\frac{3}{4}$ xvj.

Twelve hours after the commencement of the attack he was in a state of complete collapse; vomiting and purging continue; cramps the most violent I had hitherto witnessed; pulse imperceptible. Ordered to inhale two bladders of oxygen gas: during the operation the countenance became animated; pulse perceptible, 100.

Much restlessness and pain at the epigastrium, for which a mustard cataplasm was applied, and kept on for 30 minutes.

Ordered the mixture of tinct. kino and sp. æther nit., as prescribed for Tatten.

Nov. 20th. Half past 3 P. M.—Complete collapse has returned; skin covered with cold clammy sweat; no pulse. The oxygen was repeated with effects similar to those above; the pulse was again perceptible, and the colour of the face and hands improved.

R Pulv. Sinapeos ʒj.

Sp. Æther Nitr.

— Ammoniaë ā ā ʒ iij.

Aquæ ʒj. Fiat haust. stat. sumend.

The mustard failed to produce vomiting, none occurring during my stay, which was for an hour after its administration.

Ordered warm hollands and water, and an enema of starch, mustard, and tinct. kino.

Complains of great heat of the surface of the body, though the skin is as cold as clay: calls constantly for cold water.

He died a few hours afterwards.

I administered the oxygen in several other cases with similar relief, at the time; but as I did not further attend the cases (some of which were seen by Mr. Ainsworth of London), I cannot speak fully of the results; and have confined myself to the narration of cases which I attended to their close.

I may add that dry heat and assiduous friction were employed in all the cases I attended.

CASE XXXVIII.

Dec. 6th. — Mrs. G. æt. 22, complains of a tingling sensation in the fingers and toes, with slight cramps of the legs, and a burning sensation at the pit of the stomach, attended with vomiting, but no purging. Skin covered with cold sweat ; pulse scarcely perceptible.

R Sodæ Bicarb. ʒj.

Aquæ ʒij. Stat. sumend. et omni horâ repetend.

In ten minutes afterwards she felt much relieved; the burning pain ceased, and the vomiting abated : a genial warmth of surface succeeded.

Three hours afterwards I found her with warm skin ; pulse 90 ; tongue moist ; the vomiting had entirely ceased ; and she had passed some pale urine.

She was ordered to continue the soda, with warm demulcent drinks.

7th. — Found her convalescent ; ordered a mild aperient.

CASE XXXIX.

Dec. 7th. — Charlotte Wardropper, æt. about 38, Maind's Court. Was attacked at 4 P.M. with a tingling sensation in the fingers, total loss of power in the lower extremities, and a feeling as if she were sinking through the bed : cramps in the legs ; pain at epigastrium, and vomiting ; tongue moist and slimy ; pulse 98, irregular ; her husband had given her some brandy and pepper : she felt worse

after it. When visited, at 7 P. M., warm applications and frictions were ordered; and sodæ bicarb. ʒj., in solution, every hour, with warm diluents.

12 P. M. — Found her much better; warmth restored to the surface; vomiting, pain, and cramps had ceased. Had had one motion and passed urine; pulse 60, full. Continue the soda.

Dec. 8th. 10 A. M. — Has passed some bilious dejections; much improved.

9. — Convalescent.

On the 10th the daughter of this patient was attacked with precisely similar symptoms: the same treatment was adopted, and on the 13th she was convalescent.

CASE XL.

Dec. 8th. — Miss R. æt. 27, of delicate habit, was attacked at 3 A. M. with giddiness, loss of vision, and formication of the hands and arms.

At 4 A. M., when visited, she complained of violent pain in the region of the stomach, with disposition to vomit. Pulse 120, scarcely perceptible; tongue cold, pale, and moist; surface cold; countenance sunk; cramps of legs severe.

She was ordered to take half a drachm of the bicarbonate in solution every half hour: the pain at the stomach was diminished after the first dose. A mustard cataplasm was applied to the epigastrium; heat and friction to the extremities.

5 A. M. — Complains of sinking, and says she is not sensible of having a body and limbs; has no

power of moving the right arm; on pinching the skin there is no sensation. Cramps abated.

Soda to be continued.

6 A. M. — Loss of power in the right arm continues; the pain at the stomach is relieved; cramps gone; less disposition to vomit.

An enema of starch with salt, and ol. terebinth $\bar{3}$ ij. was administered, and retained for half an hour, and spoonfuls of sago with brandy were given at intervals; she is evidently improving.

A vein was now opened and eight ounces of dark tenacious blood were obtained: it possessed little or no serum.

At 7 A. M. every distressing symptom had vanished; sensation was restored in the arm. She was ordered warm diluents, and to omit the brandy.

R Calomel ppt. grs. iv.

Conf. Rosæ q. s. ut fiat Bolus, s. sumend.

R Pulv. Jalapæ 3 ss.

Magnesiae Bicarb. 3 j.

Conf. Aromat. 3 ij.

Aquæ Menth. Pip. $\bar{3}$ vj. m sumat i ss.
omni horâ.

8 A. M. — Passed copious dejections without any feculent matter; the dejections consisted apparently of the fluids that had been taken.

She continued to improve, her debility was excessive: but no further medicine was necessary; and she was cured.

CASE XLI.

Dec. 8th. — John Bittlestone, æt. 7., Hedworth Street, Monk Wearmouth Shore, had been ill several hours before I visited him: the case appeared hopeless. His pulse was imperceptible; hands and face blue, with violent pain of stomach; incessant vomiting and purging; cramp of legs; voice feeble; asks constantly for cold water. I ordered him a scruple of the bicarbonate of soda every half hour, and gave strict injunctions that he was to have nothing else, except barley water or gruel.

On visiting him two hours afterwards, I was surprised to find him much improved; pulse perceptible 120: was informed that he found so much relief from the medicine, that he desired to have it more frequently: he told me his "belly was quite better:" his countenance was much improved, and he had passed urine. Ordered to continue the medicine.

9th. 10 A. M. — Found that all bad symptoms were removed; pulse 96; skin becoming warm; he had taken some milk and bread.

Vespere. — Had passed some bilious dejections; complete re-action was established. On the 11th he was convalescent.

CASE XLII.

Dec. 11th. — Eliz. Bittlestone, æt. 23, sister of the above, a fine healthy young woman, had been unremitting in attention to her brother; was at

tacked with the disease on the 11th. When seen, two hours after the attack, she had had violent vomiting and purging: I found her pulseless: breathing difficult and oppressed; surface cold and clammy; much jactitation; cramps severe, with violent pain of the stomach, and much thirst; eyes sunk; countenance livid: she refuses to take medicine, and calls urgently for cold water: a pint of warm water was given her, and rejected with great force.

A drachm of subcarbonate was given, and ordered to be repeated; but she refused to take any thing, and desired to be left to die.

She perished a few hours afterwards, on being raised up to relieve her bowels.

CASE XLIII.

Dec. 11th. — John Bittlestone, sen., æt. 45, father of the two last patients, was attacked at the same time with his daughter, with vomiting and purging of the rice-water character; his surface was cold, and covered with clammy sweat; his pulse fluttering; countenance anxious; complains of complete loss of power in the hands, arms, and legs; has slight cramps of the legs. When the symptoms came on, he took some carbonate of soda, which had been left for the child, and he stated that these had entirely removed the pain he had felt in his stomach. He was ordered to continue the soda, — a scruple every ten minutes, — drinking plentifully of diluents.

At my second visit I found him much im-

proved ; warmth returning ; vomiting abated ; but suffering much distress about his daughter.

12th. — On visiting him this morning, I found him walking about his room ; pulse 80 ; tongue moist and clean ; had passed urine, and slept some hours. He continued to improve till the time of his daughter's funeral. When the bearers were removing the body from the house, he was again seized with vomiting, purging, and cramps. The soda was again given, with warm diluents.

I visited him the next morning : partial re-action was established ; his pulse was feeble, 96 ; tongue furred ; complained of pain in the head ; had passed no urine. He survived two days, sinking gradually.

The constitution of this man was worn out by previous disease.

William Bittlestone, son of the above, was attacked with the premonitory symptoms ; but recovered under the use of soda carb., with warm diluents.

CASE XLIV.

Dec. 13th. — Anne Gardiner, æt. 27, a married woman, has had diarrhoea for some days. Was attacked with pain in the region of the stomach ; vomiting, purging, slight cramps, and formication of the extremities. At 11 A.M. she was ordered soda bicarb. ʒj. omni semihorâ ex aquâ.

14th. Morning. — Pain of stomach, vomiting, purging, and cramps have all left her : pulse 80, — having been 100 and feeble the preceding day ; tongue moist.

15th. — Convalescent.

I have found the bicarbonate equally successful in removing the premonitory symptoms; but it would be tedious to enumerate these cases separately.

CASE XLV.

As you expressed a wish to have the particulars of my own attack, I subjoin them, with my permission to make any use of them you may wish.

On Sunday, Nov. 6th, in the evening, I was attacked with violent pain in the region of the stomach, with disposition to vomit: I had slight spasms of the muscles of the arms, and my legs and feet felt as if immersed in cold water: my body was covered with clammy sweat. I took tinct. opii, grs. xxx.; went to bed, and applied hot flannels, &c. to the abdomen, &c.

Soon afterwards, I was attacked with vomiting and purging, and with cramps affecting every part of my body, and shifting from place to place.

Dr. Miller and Mr. Fothergill visited me, and advised the tinct. opii to be repeated at intervals; giving me at their visit 30 or 40 drops.

I continued in this state for several hours, the cramps somewhat abating; pulse from 96 to 100. Sp. lavendulæ c. and sp. ammoniæ c. were given at intervals, in doses of two drachms.

At 4 o'clock the next morning I fell into a tranquil sleep. This continued four hours. I awoke completely relieved. Slight soreness of the epigastrium was the only uneasiness I felt. I took a dose of calomel and some aperient medicine, and in two days I was quite well.

A few days before my attack, I had felt slight cramps in the legs, and shooting or darting pains in the arms: my bowels were regular, and I considered myself as well as I had been for some time past.

On the 1st of December, at 3 A. M., I was again attacked with the preliminary symptoms of the disease, — giddiness, a feeling of sinking, formication of the extremities, laborious breathing, with uneasiness of the bowels. I took a draught, containing

Sp. Lavendulæ comp.

Sp. Ammoniac comp. ss. ʒ ij.

Dr. Haslewood soon afterwards arrived, and observed these symptoms, and the relief obtained from diffusible stimulants, — the pulse becoming fuller and slower after the administration of the draught.

I afterwards took a dose of calomel, followed by the compound powder of jalap. in mint water. In a day or two I had quite recovered.

That these symptoms were premonitory of, and would have been followed by, an attack of Cholera, if they had been neglected, I have not the slightest doubt; and that many other medical men had similar attacks is a matter of fact, known to most of those who paid particular attention to the subject.

Believe me, dear Sir,

Very faithfully yours,

(Signed) J. R. TORBOCK.

MODE OF PROPAGATION OF THE DISEASE

Sunderland, properly so called, exclusive of Bishop and Monk Wearmouth, is seated on the right bank of the river Wear.

Its principal features are two long streets, — the High Street and the Low Street. The latter bends, and follows the course of the river; but the High Street has only one slight curve, and it abounds with shops of considerable display. It is a cheerful and broad street, and generally well filled with people.

The Low Street is narrow, abounding with building yards, breweries, anchor-smiths' shops, &c.; and the lanes which connect the Low with the High Street are also narrow, and inhabited by the poorer and working classes. But the great mass of the population lies on the south of the High Street, in streets at right angles; and these streets are occupied principally by persons closely connected with the active duties of the coal trade, — such as sailors, keelmen, casters, &c. At the east end, which is terminated by the barracks, are several streets or alleys, ill laid out, ill arranged, and where the circulation of fresh air meets with occasional difficulty; and it was in this part of the town that the disease lingered. The lower portion of the town of Sunderland lies nearly level;

but towards the west end the ground rises gradually towards Bishop Wearmouth; and the difference of level between the lower part of the High Street of Sunderland and Bishop Wearmouth church-yard may be stated at 96 feet. The difference of level between the church-yard of Sunderland and Bishop Wearmouth is 73 feet.

A practice prevails in many of the inferior streets of having common middens *let in* to the houses; which are receptacles for the ashes and filth of the street. Trap doors are affixed to them: at stated times the contents are sold to the country people, as manure, and become a source of profit. These nuisances ought to be immediately removed. In some long streets there are as many as ten or twenty of them. In many of these streets the houses are large and well built, with rooms of a much more comfortable description than the ordinary dwellings of the labouring classes possess. These houses, now divided into tenements, were formerly the residences of the wealthiest classes.

With this exception, Sunderland is not *worse* than other towns connected with shipping; yet the duty of scavenger does not seem to be well understood; and these middens, above all, ought not to be suffered to pollute the air, and still more the houses of which they form so essential a part. The situation of Sunderland, shelving towards the river, would seem to render it a town which might be kept clean without difficulty.

Bishop Wearmouth is the west end of Sunderland, with which it is connected principally by the High Street. The richer citizens live in Bishop

Wearmouth ; and it is a curious circumstance that the Sunderland assemblies seldom or ever contain one single inhabitant of Sunderland.

Monk Wearmouth is an irregular town on the north side of the river, connected by a noble bridge with Bishop Wearmouth, and by a ferry boat with Sunderland.

The population of *Sunderland* may be stated at

Seamen	-	1849			
Militia	-	7			
Others	-	7179	Males.	Females.	Total.
	—		9035	9881	18,916

Bishop Wearmouth.

Males.	Females.	Total.
6328	8134	14,462

Bishop Wearmouth Pans.

Males.	Females.	Total.
163	200	363

Monk Wearmouth.

Males.	Females.	Total.
688	810	1498

Monk Wearmouth Shore.

Males.	Females.	Total.
2649	3402	6051

Note. — Seamen are not included in the parishes of Bishop Wearmouth, Monk Wearmouth, &c.

The population gradually increases to the amount of nearly 500 persons per annum.

The town depends on the coal trade. The number of chaldrons shipped from this port may

be stated at 1,000,000 imperial chaldrons ; the number of ships 696 ; and it is for tonnage the fourth port of the British empire.

Ship-building flourishes, and occupies about 1500 carpenters. A few glass-houses are of long standing ; and the rope manufactories are also in high repute : but the staple commodity is coal.

The people more immediately dependent on the coal trade are sailors, keelmen, and casters.

The inhabitants of Sunderland are industrious, laborious, and enterprising ; and it may be remarked, that they are both quietly and well disposed, and that street riots and night brawls are of extremely rare occurrence.

The trade of the port is too expansive for its river. The enterprise of the inhabitants is acknowledged ; and they are now endeavouring by artificial means, in the formation of wet docks, to extend the limits of their port.

Sunderland is in the centre of the coal field ; and the inhabitants feel and appreciate the advantages which nature has given them : and their rising consequence is proved by the fact that they are to have two representatives in parliament by the Reform Bill.

The sailors are an industrious class ; brave, resolute, and daring. A collier will make, on an average, ten voyages to London, and a sailor may gain about 36*l.* per annum. On board ship he lives well, on the best provisions. Their number at this time is 5266 ; and they are generally in full employ.

The keelmen are a hardy race. They bring coals from the upper part of the river to the vessels

in the port. The casters throw the coals into the port holes of the ships ; and there are numberless trades connected with the support, and wear and tear of shipping, which it would be extremely difficult to calculate.

In fact, more or less, every man is connected with shipping ; and there is hardly an inhabitant of the three parishes who is not interested in, or who does not hold some portion of, a ship.

From the prevalence of long-continued unfavourable winds, the ships are generally formed into fleets ; and sometimes as many as 150 or 200 ships will enter the harbour at one tide : and as their owners are all anxious to get them away as soon as possible, labour is in great demand, and large wages are given ; and casters will then increase their earnings considerably beyond their ordinary standard.

In fact, though the employment is great, and wages good, yet, from the very nature of the trade itself, — depending on the winds of heaven, it is not constant or regular, but comes in *gluts* ; and an industrious man, at such times, can make two or three days' work in one.

At other times, when the fleets are absent, the trades connected with shipping are preparing materials for their arrival ; and the keelmen and casters are in comparative inactivity.

A sailor, as soon as he comes from sea, quits his ship, receives his wages, and is not bound to go another voyage in the same vessel : it is a fresh binding each voyage. And when 200 ships arrive, and 1400 sailors receive their ordinary wages of

3*l.* per voyage, the town is naturally bustling, and the expenditure considerable.

If, from the long-continued prevalence of north winds, the ships do not arrive for five or six weeks together, the pawnbrokers' shops become filled with the goods and chattels of the sailors, which can only be redeemed on the arrival of the fleet.

Thus, although the sailor's life is, comparatively, one of great interest and vicissitude, and they are well fed and well paid, yet their families are frequently reduced to great distress during their absence; and their living is consequently extremely irregular. Added to this, the characteristic improvidence of sailors will account for the misery that occasionally prevails at Sunderland. The sudden demands for labour connected with shipping, and its uncertain duration, naturally create

TABULAR VIEW, showing Connection between the Subjects

Date of Attack.	No.	Name.	Residence and Trade.	Sex.	Event.
Oct. 23.	1.	Sprout, Senior	On the Quay, Labourer	M.	Died
27.	2.	Sprout, Junior	Ballast Keelman	M.	Died
—	3.	Sprout	—	F.	Recovered
31.	4.	Rodenby	Quay, Monk Wearmouth, Shoemaker	M.	Died
—	5.	Thomas Wilson	High Street, Keelman	M.	Died
Nov. 1.	6.	Nurse	Infirmery	F.	Died
6.	7.	Etherington	Burleigh Street, Sailor	M.	Died
—	8.	Ellimore	Hatcase, Pilot	M.	Died

great excitement for the moment, which is followed by its usual train of languor.

The charitable institutions are numerous, and well managed ; and, above all others, the Indigent Sick Society, with comparatively small means, does more active good than most of the public institutions. The committee visit the sick at their own dwellings, and administer instant relief, in money, in clothing, or by medical treatment, as the occasion may require.

The inhabitants are not backward in their subscriptions, where such aid is required ; and the very large amount subscribed during the prevalence of the late epidemic has sufficiently proved that the benevolent and charitable feelings of the inhabitants may be equalled, but cannot be surpassed, by any town in the empire.

of Attacks of Cholera, which came under the Notice of the Authors.

Remarks.
No contagion has been traced : he laboured under diarrhœa and other disorders for some days previous to the attack. Attended by Mr. Holmes, Surgeon.
Communicated with No. 1. his father ; died in the Infirmary.
Daughter of No. 2. Infirmary.
No connexion traced.
No connexion traced.
Assisted in removing the body of No. 2., but did not see him during life : she was under great alarm, and was attacked some hours afterwards.
Had been in a weak state for some time previous ; died the same day.
Was an habitual drunkard ; was very drunk the day previous.

Date of Attack.	No.	Name.	Residence and Trade.	Sex.	Event.
Nov. 6.	9.	Haslewood, Mrs.	Wearmouth Walk	F.	Recovered
—	10.	Torbock, Mr.	High Street, Surgeon	M.	Recovered
7.	11.	Crawford	Low Street, an old Sailor	M.	Died
—	12.	Crawford	—	F.	Recovered
—	13.	Short	Low Street, Fish-woman	F.	Died
8.	14.	Glover	New Town	M.	Recovered
—	15.	Swinney	Harris Lane, Prostitute	F.	Died
—	16.	Wilson, Elizabeth	Robinson's Lane	F.	Died
10.	17.	Etherington	Burleigh Street	F.	Recovered
—	18.	Wilson, Margaret	Silver Street	F.	Died
13.	19.	Wardle	Bain's Lane, Joiner	M.	Recovered
—	20.	Barrett	Zion Street	F.	Died
—	21.	Phillips	Sailors' Alley, Prostitute	F.	Died
15.	22.	Wayman	Buck's Square, Warren Street, Prostitute	F.	Died
—	23.	Embleton	High Street	F.	Died
16.	24.	Nicholson, and 4 children, and 1 grandchild	Chancery Lane	F. F. F. F. M.	Recovered Do. Do. Died Do. Do.
—	25.	Findley	Sailors' Alley, Prostitute.	F.	Died
17.	26.	Tatten	Buck's Square	F.	Recovered

Remarks.
Her husband examined the bodies of Nos. 2. and 4., and visited No. 6. on the 1st November.
Examined the bodies, &c. with Dr. Haslewood and Mr. Mordey.
An habitual drunkard, living in a confined situation.
Wife of No. 11.
No connexion traced; her house was crowded with friends during her attack, which continued four days; no case amongst them; body examined.
This man being nearly drowned, was taken into the house of Mr. Etherington on the quay, for the purpose of recovery on the 6th, and Mrs. Etherington had been to see the body of No. 7., her husband's brother, that evening.
Of irregular habits.
Grand-daughter of No. 5.
Wife of No. 7. Attended by Dr. Gibson.
Daughter of No. 5. and aunt of No. 16., attended her father during his illness.
Living in a close confined house.
Wife of a landing waiter of custom-house; no contagion traceable; had a large family, but no other case in the family; house clean; all continue well.
Attended the funeral of No. 15.
Had been in the river, up to the waist; caught cold, and was attacked immediately after.
Mother of Mr. Embleton, Surgeon, of Sunderland parish, in whose house she lived, and who was in constant attendance on cholera cases.
The mother assisted in laying out the body of No. 15.; the children had no communication with any one affected with the disease; they were attacked before the mother; — an infant.
Communicated with No. 21.
Sat up with No. 22.

Date of Attack.	No.	Name.	Residence and Trade.	Sex.	Event.
Nov. 19.	27.	Haswell	Back Row, Bishop Wearmouth	F.	Died
20.	28.	Knell	Buck's Square, Pilot	M.	Died
—	29.	Thornton	Sailors' Alley, Prostitute	F.	Died
21.	30.	Cummings	Near the Infirmary	F.	Recovered
23.	31.	Fell	Mill Street, Gardener	M.	Died
—	32.	Melin	9. Mill Street, Tailor	M.	Died
25.	33.	Five persons, names unknown.	In the Sunderland Poor House	F. F. F. F.	Died Do. Do. Recovered
26. 27.	34.	Purvis, and two children.	Mill Street	F.	Died Do. Do.
28.	35.	Wilson	Sailors' Alley, Keelman	M.	Died
26.	36.	Kirkman	9. Mill Street, Hatter	M.	Died
27.	37.	Elliott (child)	Warren Street	F.	Died
—	38.	Woodall	Cross Street, Washerwoman	F.	Died
28.	39.	Elliott	Warren Street, Keelman	M.	Died
—	40.	Purvis	Robin's Lane	M.	Recovered
—	41.	Wardle	Bain's Lane	F.	Recovered
29.	42.	Eilly	Sailors' Alley	M.	Died
—	43.	Woodall	Cross Street	M.	Died
—	44.	Nason	Bain's Lane	F.	Recovered
Dec. 2.	45.	Fairley, Mrs.	Cholera Hospital	F.	Died
—	46.	Knell	Warren Street	F.	Died
7.	47.	Todd	Warren Street, Pilot	M.	Died

Remarks.
Had no direct communication ; this case occurred in a part of the town remote from all the other cases.
Residing with, and son-in-law of, No. 26.
Communicated with No. 21.
Attended No. 27. ; lived in a healthy situation.
The house in which he lived communicated with that of Nos. 21. and 29. in Sailors' Alley, which runs parallel with that of Mill Street.
No. 9. is a lodging house, in which some persons had previously died ; Melin slept there on his way from Edinburgh to Manchester.
There was no direct communication of persons affected with the workhouse ; but the sedan, in which the patients were conveyed, was kept there, and the inmates amused themselves by carrying each other about in it.
Aunt of No. 5., and grandmother to the children, and, of course, related to Nos. 16. and 18.
Brother of No. 34., whose funeral he attended on the 28th ; he was attacked the same night.
Died in hospital ; a lodger. Vide No. 32.
Related to, and communicated with, Nos. 26. and 28.
She washed the clothes which were worn by No. 23.
Father of No. 37. ; related to 26. and 28.
Brother-in-law of No. 39., was attacked shortly after visiting him.
Wife of No. 19., was attacked soon after laying out the body of a girl, who died of Cholera the same morning.
Assisted in carrying No. 35. to the grave ; was attacked at 8 r. m. the same night.
Husband of No. 38.
Applied friction, &c. to No. 41.
Head-nurse of the hospital.
Lived in the house of No. 39., her son-in-law, and was mother of No. 28.
Same house as Nos. 39. and 46...

Date of Attack.	No.	Name.	Residence and Trade.	Sex.	Event.
Dec. 11.	48.	Carr	Stamps Lane	F.	Recovered
12.	49.	Carr, aged 6 years	Ditto	F.	Died
15.	50.	Carr, James	Ditto	M.	Died
19.	51.	Carr, J.	Ditto	M.	Died
8.	52.	Bittlestone, aged 7 years	Hedworth Street, Monk Wearmouth	M.	Recovered
—	53.	Bittlestone	Ditto	F.	Died
—	54.	Bittlestone	Ditto	M.	Died

OF THE PREDISPOSING CAUSE OF THE DISEASE.

The ravages of the disease, as it appeared in Sunderland, having been almost confined to the class residing in close ill-ventilated situations, might lead to a notion that the enjoyment of fresh air, comfort, and cleanliness, affords an exemption from susceptibility to its attacks. But whether we regard human contagion, or a miasma creeping along the banks of rivers (just so far as navigation extends) as the exciting cause, certainly the wealthier classes were but little exposed to its influence. Their residences are generally at a distance from the chief seat of the disease; and, with the exception of those who visited the sick poor from motives of benevolence, the intercourse between the two classes has been very limited. Notwithstanding, however these circumstances, there did occur, even among those in situations the most healthy, cases sufficient in number and fatality to remove the idea that superior comforts exempted the wealthy from its influence.

Remarks.
No connexion traced.
Daughter of No. 51.
Son of No. 51.
Husband of No. 48., and father of 49. and 50.
No connection traced.
Sister of No. 52., on whom she was in constant attendance.
Father of Nos. 52. and 53.

Symptoms described in the early part of the work as premonitory, distension of the abdomen, with oppressed breathing, with cramps, or formication of the extremities, succeeded by diarrhoea, were by no means uncommon in this class; but the importance of attending to them being generally known, the persons so affected were not slow in sending for medical aid.

Of those amongst whom the disease prevailed, the majority of sufferers were persons weakened by old age, by insufficient food, clothing, and fresh air, or by previous disease; and, above all, those addicted to the use of ardent spirits. Mental anxiety, from its depressing effects, seemed to render persons peculiarly liable; and the attack frequently took place after some exposure to wet and cold.

In fact, whatever tends to disturb the balance of the circulation, or diminish nervous energy, either directly or indirectly, will dispose to Cholera. But there is no cause apparently more powerful than a continued exposure to the exciting cause of the

disease. When a person continues long in attendance in the houses of Cholera patients he will find that his vital energies are gradually diminished ; that digestion is impaired ; and that his sleep is disturbed with cramp, or other uneasy sensations. We believe few persons have been actively employed in attending the poor in the present epidemic without feeling more or less of these sensations. Enough has been said of the importance of early attention to such indications.

Age and Sex. — With the exception of old age, no period of life seemed to have any peculiar liability to attack. The infant of Mary Anne Nicholson, a patient in the hospital, whose case is reported, died of the disease. It was five months old, and sunk at once into collapse, after having shown symptoms of uneasiness the preceding day. Another child, about a year old, died ; and several others from two years upwards. In one of our visits we found two mothers, living in the same house, each with a child dying in her arms. The disease usually carried them off in a few hours ; the vomiting and purging were very trifling, and cramp seldom occurred. Complete collapse came on at once ; the eyes were frightfully sunk in their sockets ; the skin deadly cold, and of a dark leaden hue ; they never cried, and would generally swallow what was given to them. In very young children, the cheeks did not shrink ; which afforded a striking contrast to the sunken eye. The appearance of the blue skin and hollow eye in childhood has something so unnatural, that the impression is most unpleasant, and can scarcely be afterwards effaced. The great majority of females attacked is a differ-

ence perhaps more apparent than real. In the late census, it appears that there is a remarkably large proportion of females in the population of this town ; in addition to which a number of males, chiefly from the streets where the disease was most fatal, were absent at sea. This opinion is corroborated by the parish register of Sunderland, where it appears, that between the ages of 15 and 50 the deaths of females were more than double those of males ; while before and after that age they were equal. Dr. Ogden has offered an opinion (in a late number of the Medical Gazette), that the discrepancy is attributable to the warmer clothing of the men, who always wear flannel shirts and drawers. If a real difference does exist, it is probably owing to this cause.

EXCITING CAUSE.

There are two opposite opinions on the nature of the exciting cause of Cholera, — the one, that it is a cause existing independent of previous disease, inappreciable by our senses, the nature and origin of which, and the laws of whose action, are utterly unknown.

The other opinion is, that it is an emanation from the bodies of persons affected with the disease.

A third party attribute the appearance of the disease to the first cause, but believe it may, under certain circumstances, be propagated by the second.

With regard to the first origin of this disease, the contagionists profess themselves to be as much in the dark as we confessedly are as to that

of any of our acknowledged contagious fevers. From the facts stated in a tabular list of cases which came under our observation, we have no doubt that the disease has propagated itself in this town, and from this to neighbouring places, according to the laws of contagion. For, in the first place, in the great majority of cases direct communication was traceable. In most instances more than one person suffered in the same house, and these were attacked in successive days. This fact would have appeared still more obvious if the cases which were treated in the preliminary stage had been noted. Many persons took the disease after having been employed about the dead bodies; and it would appear either that the emanations from the dead are more actively infectious, or that mental affections have rendered the persons employed peculiarly susceptible.

2dly, To many of these cases it may be objected, that the subjects were residing in situations where the cause of the disease, be it what it might, was known to be active. To the following, however, the objection does not apply; the persons attacked never having been in the affected districts, but having taken the disease after communicating with those who had been removed from such situations.

On the 31st of October, two persons died of Cholera,—Rodenburgh in Monk Wearmouth, and Sprout in the Infirmary fever-ward. Both bodies were examined the following morning; the former by Dr. Haslewood, Mr. Torbock, and Mr. Mordey; the latter, in the presence of those persons and others, by Mr. Penman.

The nurse of the Infirmary, who assisted in

removing the body of Sprout to the dead-house, and had no other communication with the fever-house, was attacked nine hours afterwards, and died.

Mr. Penman (who wounded himself in the dissection) was attacked the same evening with sudden giddiness and faintness, while walking; and with great difficulty got home. This was succeeded by violent watery diarrhoea, with cramps, and great prostration of strength. He recovered under the use of brandy, opium, and calomel; but continued in a state of low fever for several days.

On the 6th of November, the wife of Dr. Haslewood was attacked with Cholera: the case is given in a former part of this work. She communicated with her husband on his return home.

Mr. Torbock was attacked with the disease on the same day.

A woman named Haswell was attacked on the 19th of November. She resided in the west end of Bishop Wearmouth: some of her connections lived in the low part of Sunderland, but it is not clear in what way she took the disease. She was attended by her daughter, and a Mrs. Cummings, both of whom lived in Bishop Wearmouth. The daughter was attacked with diarrhoea, Mrs. Cummings with Cholera, the disease commencing with sudden faintness.

Mrs. E., mother of a surgeon who was in constant attendance on Cholera cases, resided in the house of her son, and never went out. She took the disease, and died.

The person who washed the clothes, &c. used by this patient, took the disease.

The Cholera Hospital is situated to the south of the town, in an airy, open situation; the wards were large and lofty. In this establishment, four females were employed as nurses and washerwomen; all, however, occasionally employed in administering to the patients. Of these, the principal nurse, who was indefatigable in her attention, took the disease in its worst form, and died in eight hours. Another, Elizabeth Snipes, was attacked with diarrhoea, and other preliminary symptoms. She recovered; but three days afterwards committed an error in diet, was attacked with Cholera, and recovered.

The porter of the Hospital was attacked with diarrhoea, and great nervous agitation: he quickly recovered under proper means.

The disease commenced at Houghton-le-Spring, in the person of a woman who had come from Sunderland, and had been travelling about the neighbourhood as a hawker.

The first case in North Shields was that of a vagrant.

From the facts above stated, which are in conformity with the great preponderance of testimony from the Continent, and especially with that contained in the very interesting letters of Dr. Becker, concerning the facts observed at Berlin, we can no longer doubt that the disease propagates itself in strict accordance with the known laws of contagion.

This view of the subject suggests at once the necessity of precautions being used to stop the progress of the malady. When a fatal epidemic prevails, a great as well as a general alarm is ex-

cited in consequence of a notion, that the seeds of an evil so generally destructive must be diffused through the atmosphere at large ; and that if we stir abroad, we breathe contagion at every step. Experience, however, has shown, that the infection of malignant fevers, and of the plague, extends to no great distance from its source.

The great advantage that has been derived from the establishment of houses of recovery, in preventing the spread of contagious fevers, affords encouragement to the full adoption of a similar plan in this disease. The grand difficulty, however, is, to obtain so fully the confidence of the class of persons among whom the disease breaks out, as that they may be induced to apply for relief on the first feeling of mal-aise, and to come into the hospital before the disease has gone so far as to leave the patient but a slight chance, even where every remedial measure can be at once adopted ; and it is highly important to effect the removal of the patient before opportunity has existed of his communicating the disease to others. But, unfortunately, there is always a strong prejudice against such institutions : the people are suspicious of interested motives, and imagine that if brought into hospitals, they will be made the subjects of experiment for the benefit of others. They do not see that to prevent the extension of the danger is a sufficient object to account for the earnest persuasions which are addressed to them. One great objection to the hospitals is, the separation of the patient from his nearest relatives. The wife of the most wretched pauper thinks she can make him more comfortable with his ragged blanket than all

the luxuries of an hospital without her. On this account we have always allowed the patient to be accompanied by his wife, or any one friend who was willing to remain and nurse him: this had an excellent effect by instilling confidence; besides which, their services were useful in a disease requiring such unremitting attention.

It is of great importance, in the choice of a place for an hospital, to have large and lofty rooms, to secure free ventilation, and to enable those who have charge of the patients to superintend a number at the same time: for, in fact, a patient in the cold stage of Cholera should scarcely ever be lost sight of.

The possession, then, of spacious wards is a matter of the first importance; and if the building selected possess this requisite, it is easy, at no very great expense, by stoves, &c., to warm it, and form a comfortable house of recovery. If no such building can be obtained with the requisite dimensions, the next best thing will probably be to erect hospitals on the plan which was adopted in Ireland during the prevalence of the epidemic which was so fatal in 1818, and subsequent years. They were constructed of a number of strong upright posts, firmly fixed at equal distances, about eight feet in height, and supporting a set of rafters, or roof frame, with the proper degree of inclination. The whole was then covered with canvass, which in some instances was rendered weather proof by a coating of lime mixed with drying oil. These hospitals were warmed with stoves, and are stated to have been extremely comfortable.

Another measure of great importance is the

purification of the houses in which the disease has appeared, and of the clothes and furniture of the sick. When the fever was raging in Dublin, in 1818, an excellent plan was adopted for this purpose. A house was taken, and fitted up with the necessary apparatus for washing, and with a stove, for exposing to a high temperature such articles as could not be washed. The expenses of this establishment were, for outfit, 37*l.*, and 12*l.* per month current expenses. During a period of six months, 1077 persons had their clothes and bedding purified; and 3871 rooms were white-washed, and straw supplied to their inhabitants.* In Sunderland a more expensive, but not less effectual, plan was adopted, — *burning* the bedding, and white-washing the houses.

Much has been said of the efficacy of chlorine in destroying contagion. Though contagion is in itself so subtle as to be known only by its effects, occurring at periods varying from the shortest up to many days; yet, from its activity being most strongly displayed in close, ill-ventilated situations, where it occurs associated with offensive odours, the popular notion is, that it is very similar in its composition and character to such odours; and the idea has naturally arisen, that chlorine is equally efficacious in destroying each. The notion, however, is founded upon the gratuitous assumptions that hydrogen enters into the composition of contagion, and that chlorine is capable of decomposing the compound.

* Vide Barker's Medical Report of the Cork Street Fever House, for 1818; and the Edinburgh Medical Journal, vol. xv. p. 152.

Our confidence in this means of destroying contagion gave way under the experience of its want of efficacy during the prevalence of a malignant Scarlatina which was very fatal in this town during the autumn of 1830, and the succeeding winter; for the disease extended itself with great virulence in houses where the solution was used very profusely. In one way, its use may prove absolutely injurious, — if its removing unpleasant odours should cause it to be considered a substitute for ventilation.

There is another measure, to prevent the extension of the disease, which appears of great importance, — the prevention of vagrancy. The disease has been distinctly proved to have been conveyed to the neighbouring towns and villages by this practice. To our knowledge the disease proved fatal to the inmates of three lodging-houses frequented by such persons; and the relatives of one who died of the disease, and whom they attended, were met the next day on their way to Newcastle, where they would probably sleep in a room with half a dozen other occupants *for the night*. It does seem an indispensable duty of the local authorities to use every legal means for the suppression of this nuisance.

Though it is proper that as few persons as possible should communicate with those labouring under the disease, yet their situation requires great attention in supplying them with every means of alleviating their sufferings and promoting their recovery. During the prevalence of this and other contagious fevers there has never been a want, either in their own rank or among the wealthier

classes, of persons ready, at all risks, to visit the meanest hovels. The willingness which is displayed by the poor, on such occasions, to minister to each others' wants, is a beautiful trait in their character. When we consider how expensive is the sacrifice they make in devoting the night that succeeds a day of toil to watching by the bed of a sick neighbour, we shall feel that the most munificent donations of the rich do not exhibit such a proof of high and disinterested benevolence.

PRECAUTIONS TO BE OBSERVED.

These may be divided into two heads, — those against contagion, and those against predisposition.

The means of diminishing the virulence of contagion are abundantly simple. The only measure worthy of confidence (so far as our experience teaches) is free ventilation; and this will be accomplished by open windows and good fires in the sick room. In fact, in a room with a good fire opposite the door, the air cannot remain long stagnant. It has been also recommended to have a hole pierced into the chimney, near the top of the room. The beds should never be suffered to stand within less than a foot of the wall; and all superfluous furniture should be removed. All discharges from the patient should be instantly removed; and the dirty linen, &c. immersed in water. It is also necessary to caution the ignorant attendants to keep on the windward side of the patient, and avoid his breath. When death occurs, the body should be at once wrapped closely in a sheet, or, if

attainable, in cerecloth, without washing, or unnecessary handling.

Under the second head, it is a point of primary importance that persons labouring under terror of contagion should be on no account suffered to remain with, or visit, the patients. Much evil has arisen from such persons, under a sense of duty, having exposed themselves, when others devoid of such fears might have been obtained. Care is also requisite that a sufficient number of attendants be employed, to prevent any of them being subjected to extraordinary exhaustion and fatigue. The diet of such persons should be nutritious; and they should take rather above than below their usual quantity of fermented liquors, carefully avoiding the slightest approach to intemperance. It has been recommended that the bowels should be kept in a costive state, — a piece of advice of very questionable propriety; since this state, if suffered to continue long, is certain to be succeeded by general constitutional disturbance, and often by diarrhoea.

The precautions to be observed, then, by the attendants of the sick are, to dilute contagion by fresh air; and never to go within its sphere when the body is in a state of debility or disease. To others we say, that experience has shown that those who avoid communicating with the affected have very rarely, if ever, been attacked; and that any alteration of their usual habits, unless avoiding intemperance be such, is more likely to increase than diminish their susceptibility.

Concerning the manner in which Cholera was introduced into this country, we are in entire

ignorance ; an ignorance arising from the complexity of the subject, on account of the various possible modes of its introduction, and our inability to trace any of the first cases to a specific source. Before entering on the enquiry as to the mode, however, it is necessary to fix the period of its first appearance ; and this would appear — if perfect similarity of symptoms can identify a disease — to have been early in August. The two following cases were communicated to us by the kindness of Mr. Dixon, surgeon.

“ Allison, a potter, residing in Southwick, a mile or two up the river, was taken ill in the morning of the 5th of August. At 7 P. M., when visited, he was vomiting and purging considerable quantities of a white fluid, like oatmeal and water ; no urine ; extremities cold ; and the whole body covered with cold, clammy sweat ; countenance sunken ; lips and nails blue ; voice hollow and husky ; pulse at the wrist almost entirely imperceptible ; over the heart it was very feeble, beating thirty in a minute ; tongue white, moist, and cold ; breath cold ; excessive spasms of arms and legs, and over the chest and abdomen ; tenderness on pressure in the region of the liver. The treatment consisted of hot brandy and water, external heat, and frictions with hot flannels and hot vinegar ; calomel and opium every hour ; and a mixture of the carbonates of magnesia and ammonia in peppermint water. When visited on Saturday morning, he was much improved ; skin warm ; pulse stronger, 76 ; vomiting only occasional ; purging continued ; spasms of legs recur on motion ; tenderness of right side continues ; voice is still husky. Ordered friction of legs to be conti-

nued, and the magnesian mixture, with ext. colocyinth and blue pill. Blister to the right side.

Sunday, 7th. — Heat of skin natural; some spasms; dejections continue the same; tongue black, of an inky appearance. Continued the pills, with castor oil and tinct. sennæ.

8th. — Has passed a bilious stool and some urine; is in a state of ptyalism; no spasms; voice becoming natural. He continued improving from this time with symptoms of fever, and did well.

This case appears perfectly similar to those which occurred during the epidemic, and exhibits symptoms very rarely, if ever, met with in our ordinary Cholera. The total suppression of the secretions of bile and urine up to the fourth day, and the complete relief of the cramps which had continued to that time simultaneously with the restoration of secretion, are interesting.

2d. Arnot, residing at Pallion, opposite to Southwick, and higher up the river, was attacked with all the symptoms of malignant Cholera. He was visited by Dr. Brown. He died in 12 hours.

Robert Henry, a pilot, residing in the east end of the town, was attacked on the 13th of August; had most violent symptoms. He was attended by Dr. Miller, who considers the case to have been one of "aggravated English Cholera." He died the day after the attack, in a state of coma.

Pearson, a shipwright, was attacked at three in the morning, 27th August, with purging, vomiting, and violent cramps. He was not seen till about 7 A. M., a patient in the dispensary, under Dr. Haslewood. The ejections were watery, and contained flocculent matter. By eight he was in a state of complete collapse, pulseless, blue, and cold. By

most assiduous frictions and heat, with brandy, opium, ether, and ammonia, some reaction was established; the pulse being perceptible at 10 o'clock. At 12 he was in a state of fever, with full, quick pulse, and profuse perspiration; he expressed himself quite free from pain of any kind. He had calomel grs. x., and some other medicines, and was ordered to confine himself to warm diluents. In the night he again became cold: his wife neglected to send for assistance, and merely continued the warm tea. In the morning he was in a state of coma, and died 36 hours after his attack.

The writer was quite unable to discover any mark in this case to distinguish it from what he had seen described as epidemic Cholera; but, not having before witnessed the disease, did not rely upon his judgment with confidence: subsequent experience has confirmed the view which he then took of the disease.

Other cases of extraordinary severity occurred at the same period; and cases of Cholera occurred through the month of September.

On the 5th of October, the following case occurred to Mr. Dixon:—

Joyce was attacked at 5 A. M. with the usual rice-water looking evacuations, with cold skin and perspiration; tongue moist and cold; extremities livid; cramps of intense violence affecting the whole body; great jactitation; husky voice; countenance anxious, with the sunken eye, and scarcely perceptible pulse. Some improvement of pulse was obtained by the use of stimulants. The cramps continuing violent, a vein was opened, and he was bled till he became faint; the bleeding acted like

a charm; the spasms, which were intense, with every other bad symptom, instantly ceased; and the man went into a state of fever, from which he recovered in a few days. The blood was thick, dark, and of a tar-like appearance.

October 17th. — Ellen Hayard, residing in the Low Street, was attacked with well-marked symptoms, and died.

On the 26th, the cases of the Sprouts succeeded; and these were followed by others, after intervals of three or four days, till the 6th of November, when it was admitted by all who had witnessed the cases that the epidemic was in the town.

MODE OF INTRODUCTION.

There are three modes by which the contagion of Cholera may be supposed to have been introduced into this place: —

1st. By the admission of ships into the port without clean bills of health, or the performance of quarantine.

2dly. By the imperfect performance of quarantine.

3dly. By pilots or fishermen going on board of vessels from affected places on their arrival on the coast.

On the first head it would be unnecessary to offer a single remark, but for the number of absurd stories which have got into print, from “intelligent correspondents” in various places in the neighbourhood. The ground upon which these stories were founded was the fact that vessels from Hol-

land were ordered to perform a sort of "precautionary quarantine," by being moored for a certain number of days in a separate part of the river : and although, to this day, the disease is not known to have appeared in Holland, yet, when it was reported to be in this place, it was asserted that it had been introduced by the ships in quarantine having been allowed to communicate with the shore. But the absurdity of the idea was too obvious for it to obtain a moment's attention when the facts were known.

It is also certain that vessels arrived from Ham-
burgh in October with clean bills of health ; but none of the sailors of these ships are known to have taken the disease ; nor has any case been traced to connection with them.

2dly. On the sufficiency of quarantine. — It would be interesting to know precisely what degree of purification the clothes and bedding of the seamen undergo at the regular quarantine stations, — not merely what is the printed form of instructions handed on board by the quarantine officer, but what means are used to enforce compliance with these directions : though still it may appear questionable how far they are sufficient to destroy contagion, supposing it to exist in the clothes, bedding, and feathers contained in the bedding of the sailors. It is by no means uncommon for sailors arriving at a Russian port to have their beds filled with new feathers ; and these are commonly taken out on their return home, to be cleansed of the dust, &c. which adheres to them in the state in which they are purchased.

Of the large number of Sunderland ships which go to the Baltic, few are freighted with a cargo to this port; but the majority return home after the voyage is completed, — usually in the months of August and September. On their arrival the seamen are paid off, and their hammocks and clothes brought on shore and washed.

The Cholera appeared on board of some of our vessels at Petersburg, Riga, &c.; and in a few instances proved fatal. It would be an interesting, but a difficult enquiry, to trace the clothes of the persons so affected.

Certainly the introduction into the town of a quantity of such clothes and bedding, which would be dispersed through all the lower streets, would seem to offer a more plausible chance of introduction than the arrival of ships from Holland. As to the period during which contagion may be retained by fomites, there does not appear to be an ascertained limit. The experiments of Dr. Sunderland, as reported in the *Edinburgh Medical Journal* (vol. xxxvi. p. 146.), prove that a bed-cover carefully packed up will retain the variolous contagion unimpaired for a period of two years; and a statement in *Parr's Medical Dictionary* (vol. i. p. 483.) would seem to prove that, under similar circumstances, the contagion of plague has been preserved for a much longer period.

3dly. Another mode of introduction remains, against which no vigilance of authorities here, nor of any persons on shore, could guard. The Sunderland pilots ply in the very track of the ships going to the south from the Baltic; for they

usually make the land somewhere between Tyne-mouth and Flamborough Head: and though the practice of pilots going on board these vessels was believed to be common, instances were difficult to be detected.

So great was the apprehension entertained by the magistrates of Sunderland, that a letter, bearing the signature of the whole bench, was forwarded to Government, suggesting the propriety of their sending down small vessels to cruise off the coast, and of directing the coast guard to co-operate with them in preventing the practice.

The death of the pilot Henry, in August, was stated to have occurred after he had been on board a vessel from the Baltic: but we believe the vessel in question was a foreign vessel which had performed quarantine. The matter, however, remains in some doubt, from the contradictory answers which his friends are stated to have given to various querists.

While we acknowledge ourselves to be in the dark as to the special means through which the disease has been introduced, it would still appear that there is a necessity for more effective measures to prevent communication at sea by pilots. The laws on the subject are amply sufficient, in extent of punishment; though the nature of it (a fine of 300*l.*) does not seem well adapted for the class to which our pilots belong; and the difficulty of detection renders them nugatory.

On the subject of quarantine, if the description given by Dr. Winterbottom in the *Edinburgh Journal* (vol. xxviii. p. 64.) of the practice, in 1822,

applies to the present process of purification, there seems room for improvement ; particularly in more strict attention to the purification of the clothes and bedding of the seamen, by washing, or subjecting them to a high temperature, in conjunction with free exposure to the open air.



List of Cases of Cholera which occurred in Sunderland, as stated in the Official Returns.

1831.	Remained.	New Cases.	Total.	Dead.	Recovered.	Remaining.	1831.	Remained.	New Cases.	Total.	Dead.	Recovered.	Remaining.
October 24.	0	1	1	0	0	1	December 9.	48	10	58	9	3	46
25.	1	0	1	0	0	1	10.	46	17	63	4	23	36
26.	1	2	3	1	0	2	11.	36	10	46	5	9	32
27.	2	0	2	0	0	2	12.	32	9	41	6	9	26
28.	2	0	2	0	0	2	13.	26	8	34	3	10	21
29.	2	0	2	0	0	2	14.	21	7	28	2	8	18
30.	2	0	2	0	0	2	15.	18	8	26	2	5	19
31.	5	2	4	3	1	0	16.	19	14	33	8	6	19
November 1.	0	1	1	1	0	0	17.	19	17	36	3	5	28
2.	0	0	0	0	0	0	18.	28	8	36	7	4	25
3.	0	0	0	0	0	0	19.	25	4	29	7	8	14
4.	0	0	0	0	0	0	20.	14	2	16	2	6	8
5.	0	1	1	0	0	1	21.	8	2	10	2	1	7
6.	1	6	7	5	0	2	22.	7	3	10	2	2	6
7.	2	2	4	1	0	3	23.	6	5	9	1	1	7
8.	3	0	3	0	0	3	24.	7	5	12	3	1	8
9.	3	7	10	4	0	6	25.	8	3	11	1	1	9
10.	6	1	7	0	1	6	26.	9	0	9	1	2	6
11.	6	5	11	2	2	7	27.	6	2	8	0	1	7
12.	7	4	11	0	0	11	28.	7	1	8	1	0	7
13.	11	1	12	2	2	8	29.	7	1	8	1	1	6
14.	8	11	19	3	3	13	30.	6	1	7	1	2	4
15.	13	10	23	4	4	15	31.	4	0	4	0	1	3
16.	15	8	23	6	2	15	1832.						
17.	15	8	23	1	4	18	January 1.	3	0	3	0	0	3
18.	18	13	31	5	7	18	2.	3	0	3	0	2	1
19.	18	11	29	1	5	23	3.	1	1	2	1	0	1
20.	23	8	31	3	3	25	4.	1	0	1	0	0	1
21.	25	6	31	6	3	22	5.	1	1	2	0	0	2
22.	22	13	35	3	5	27	6.	2	0	2	0	0	2
23.	27	11	38	5	4	29	7.	2	0	2	1	1	0
24.	27	6	33	5	5	23	8.	0	0	0	0	0	0
25.	23	11	34	3	5	26	9.	0	1	1	0	0	1
26.	26	14	40	5	4	31	10.	1	0	1	0	0	1
27.	31	10	41	4	5	32	11.	1	0	1	0	0	1
28.	32	14	46	8	6	32	12.	1	0	1	0	0	1
29.	32	12	44	7	5	32	13.	1	0	1	0	0	1
30.	32	13	45	4	3	38	14.	1	0	1	0	0	1
December 1.	38	8	46	5	3	38	15.	1	1	2	0	0	2
2.	38	17	55	1	10	44	16.	2	0	2	1	0	1
3.	44	7	51	6	4	41	17.	1	0	1	0	0	1
4.	41	5	46	2	6	38	18.	1	0	1	0	0	1
5.	38	5	43	2	6	35	19.	1	0	1	0	0	1
6.	35	8	43	6	4	33	20.	1	0	1	0	1	0
7.	33	7	40	2	1	37	21.	0	1	1	0	0	1
8.	37	19	56	7	1	48	22.	1	0	1	0	0	1*

* This patient died on the 9th of February: no other has occurred up to the 25th February.

THE END.

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